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Granville G. Cuningham, M.D.C.E.,

City Engineer.

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REPORT

OF THE

CITY ENGINEER

TORONTO

1891.

Toronto:
J. Y. Reid, City Printer, 73 to 81 Adelaide Street West.
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1891

MAYOR AND COUNCIL OF THE CITY OF TORONTO,

1891.

Mayor:

EDWARD F. CLARKE, Esq., M.P.P.

Aldermen:

ALLEN.	GOWANLOCK.	LUCAS.	ROSE.
ATKINSON.	GRAHAM.	MACDONALD.	SAUNDERS.
BAILEY.	HALL.	MALONEY.	SCORE.
BELL.	HALLAM.	McDOUGALL.	SHAW.
BOUSTEAD.	HEWITT.	McMATH.	SMALL.
BURNS.	HILL.	McMURRICH.	STANLEY.
FARQUHAR.	JOLLIFFE.	ORR.	STEWART.
FOSTER.	KERR.	PAPE.	VERRAL, George.
GIBBS.	LESLIE.	PARK.	VERRAL, John E.
GILLESPIE. FLETT.	LINDSEY. CREALOCK.	PHILLIPS.	

Chairmen of Standing Committees:

Executive,	Ald. SAUNDERS.
Works,	" SHAW.
Water Works,	" HILL.
Fire and Light,	" BELL.
Property,	" SMALL.
Markets and Licenses,	" VERRAL, Geo.
Parks and Gardens,	" SCORE.
Reception,	" BOUSTEAD.
Legislation,	" McDOUGALL.
Court House,	" GIBBS.
Local Board of Health,	" GRAHAM.
Court of Revision,	" HEWITT.

Heads of Departments and other Officers:

City Clerk,	JOHN BLEVINS.
City Engineer,	W. T. JENNINGS. G. C. CUNINGHAM.
City Solicitor,	C. R. W. BIGGAR.
City Treasurer,	R. T. COADY.
City Auditors,	WILLIAM ANDERSON. W. W. JONES.
Superintendent of Water Works,	WILLIAM HAMILTON.
City Commissioner,	E. COATSWORTH.
Assessment Commissioner,	N. MAUGHAN.
Medical Health Officer,	Dr. NORMAN ALLAN.
Chief of Fire Department	WILLIAM ARDAGH.
License Inspector,	ROBERT AWDE.
Superintendent of Parks,	JOHN CHAMBERS.
Chief of Police,	COL. H. J. GRASETT.
Superintendent of Public School Buildings,	C. H. BISHOP.

REPORT

OF THE

CITY ENGINEER

1891.

CITY ENGINEER'S OFFICE,
Toronto, April 5th, 1892.

To His Worship the Mayor and Members of the Council of the City of Toronto:

GENTLEMEN,—I beg to lay before you the Annual Report setting forth the works that have been done in the Works Department of Toronto during the year 1891, together with details of cost of construction and maintenance.

Yours faithfully,

GRANVILLE C. CUNINGHAM,
City Engineer.

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TORONTO.

The City of Toronto is situated upon the northern shore of Lake Ontario, about 40 miles easterly of its western terminus. It lies in latitude 49° 39′ 10″ north, longitude 79° 23′ west, on a plateau gently ascending north for a distance of three miles, where an altitude of about 220 feet above the lake level is reached. It extends about 8 miles along the Lake, and is generally level, with slight depressions at points where minor water courses formerly existed. The River Don flows through the eastern part of the City, and the River Humber immediately to the west of its western limit. The harbor is formed in front of the City by a sandy island that lies to the south, at a distance of about one and a half miles.

The area within the City limits, not including the island or portions of City land covered by water, is 10,391 acres, or 16.2 square miles.

In this area there is a population of 188,914 (Police census of City, 1891).

There are 250 miles of streets, of which 124.57 miles are paved, and 125.83 miles unpaved.

82¼ miles of lanes.
216½ miles of sewers.
428¾ miles of sidewalks.
238 miles of water mains.
207 miles of gas mains.
30 miles of under-ground electric conduit.
4,288 miles of overhead electric wire.
78¼ miles of steam railway track.
68½ miles of street railway track.

The estimated value of property owned by the City is over $12,000,000.

Assessed value of assessable property in City, $151,158,606 (1891).

Property in City exempt from taxation, value, $22,999,868.

Value of buildings erected during 1891, $4,147,815.

The sewage system of the City is very complete and extensive: its defect lies in the place of discharge into the harbor in front of

the City. When this is remedied by the construction of a trunk sewer that will discharge into the lake five or six miles to the east of the City, Toronto will have an unrivaled system.

The water supply of the City is obtained from Lake Ontario, by pumping, at a distance of 2,718 feet south of the most southerly point of Toronto Island, at a depth of 80 feet of water. The quality of the water is first-class, and the quantity abundant.

CITY ENGINEER'S REPORT,

1891.

In September last Mr. Jennings, the late City Engineer, resigned his position, and I, at that time holding the position of Deputy City Engineer, was temporarily appointed to succeed him. It now devolves upon me to prepare for the Council a report upon the various works that have been carried out under the City Engineer during the past year, and to gather together statistics and information that may be of use.

OFFICIAL STAFF.

The following gentlemen at present compose the official staff, each with the particular branch under his control :

City Engineer	Granville C. Cuningham, M.I.C.E.
Surveyor	Villiers Sankey, P.L.S.
Engineer in charge of sewers	Chas. H. Rust, M. Can. Soc. C.E.
" " roadways	H. D. Ellis, D.L.S., P.L.S.
" " bridges	John Williams, M. Can. Soc. C.E.
Accountant	J. F. Hill.
Street Commissioner	John Jones.
Secretary of Department	E. P. Roden.
" Committee on Works	A. H. Clarke.
" Plumbing Branch	W. McCartney.
" to City Engineer	G. J. Castle.
Clerk of Private Drains	C. E. Rudge.
Store-keeper	*G. W. Strange.*

FINANCIAL.

During the year just closed the total expenditure for all works and services carried out under the Board of Works has been $1,193,551.54. This was made up of $402,680.14 for works chargeable against revenue and special works, and $790,871.40 for works paid for by Local Improvement Debentures. (See Appendix A). The total expenditure under the Department in 1890 was $1,744,736.66. This was made up of $470,119.42 for work chargeable against revenue and special works, and $1,274,617.24 for works paid for by Local Improvement Debentures. Therefore, during the year 1891 as compared with 1890, there has been a decrease of expenditure on works charge-

able against revenue of $67,439.28, and on works paid for by Local Improvement Debentures of $483,745.84, or a total decrease in expenditure of $551,185.12.

At a time when there is a strong desire for retrenchment, it is gratifying to be able to show so large a reduction in expenditure, and at the same time to be able to point to the various works as having been thoroughly well executed and the streets and sewers as having been maintained in excellent condition and repair.

Below there is given a comparative statement of the expenditure for the two years, so that the items may be the more readily compared and the points where saving has been effected, at once noted.

COMPARATIVE STATEMENT OF EXPENDITURE UNDER THE BOARD OF WORKS FOR YEARS 1890-1891.

General Expenditure.	1890	1891
1. Engineering and expenses	$28,657 54	$23,428 95
2. Roadways	98,491 03	101,779 17
3. Sidewalks	30,129 77	18,493 60
4. Street cleaning	57,298 90	62,494 78
5. General purposes	46,482 76	49,681 15
6. Wooden crossings	.....	1,812 33
7. Kerbs	1,256 13	2,800 37
8. Stone street crossings	763 91	7,773 72
9. Street intersections and crossings	571 93	.....
10. Private drains, (net)	4,337 93	5,423 08
11. Bridge repairs	533 58	5,279 19
Special Services and Works :		
1. Ashbridge's Bay survey	959 30	179 58
2. Engine, boiler and machinery	.....	22 00
3. Frederick Street Wharf	157 65	2,810 05
4. Extension of sewers to Windmill line.	3,355 99	2,898 64
5. Dredging sewage	1,473 25	2,254 87
6. Jarvis Street sewer re-construction	.....	4,678 14
7. Yonge " "	2,983 13	150 42
8. Garrison Creek sewer	14,208 49	18,952 50
9. " " N.W. branch	.....	6,120 29
10. Rosedale Creek Sewer	30,469 15	10,977 23
11. King Street Subway	113,018 91	27,649 29
12. Queen "	.....	135 00
15. Don River Improvement	34,062 14	5,706 88
13. Condor System of Sewage	907 93	.....
14. Personal and Departmental accounts.	.....	41,178 91
	$470,119 52	$402,680 14

Local Improvement Works :	1890.	1891.
Sidewalks	158,086 68	125,948 02
Sewers	295,644 11	179,476 42
Pavements	518,716 77	384,011 22
Street openings, bridges, etc	302,169 68	101,435 74
	$1,274,617 24	$790,871 40

Included in the above expenditure for 1891 is a sum of $90,249.46 for land and land damages, legal and arbitration expenses in connection with the execution of various works. In carrying on work in a large City it is to be expected that a considerable amount should be expended on matters coming within the above category, but few people are aware of how large a portion of the expenditure under the Board of Works is made up of such items. The sum above stated, though appearing as part of the expenditure of the Department, is not under the control of the City Engineer.

COMMITTEE WORK.

The total number of petitions received by the Committee for local improvements during the year is 188. The number of local improvements (other than wooden sidewalks) recommended by the City Engineer is 170, made up as follows :

Sewers	72
Pavements	81
Improved Walks	17
	170

The number of wooden sidewalks recommended is 198. Twelve of these were recommended on petition of the property owners, and the balance under the special power conferred by section 26 of By-law 2439 as amended, which does away with the bringing of these works before the Court of Revision.

The following gives a comparison of the Committee work of 1890 with 1891:

	1890	1891
Petitions received for Local Improvements	393	188
City Engineer's recommendations:		
Sewers	114	72
Pavements	82	81
Wooden sidewalks	360	198
Improved sidewalks (stone flag, concrete)	19	17
Street extensions	17	5
	583	372

It will thus be seen that the policy of reducing expenditure has been adhered to in so far as the recommendation of the Engineer is concerned.

STREET RAILWAY.

Perhaps the most important matter that has engaged the attention of the City Engineer during the past year has been the granting of the franchise of the Street Railway to a new company, upon the expiry of the old franchise. The street railway system was first established in Toronto in the year 1861, by the granting of a franchise to Alexander Easton and others for a term of 30 years.

Latterly this franchise was owned by a company of which the Hon. Frank Smith was the president. Though in the early days of the Street Railway it was not remunerative as a commercial undertaking, yet with the growth of the City and the system, it became so, and as the terms of payment to the City were very light, the revenue to the Company was considerable. Under this first franchise the only payment made to the City was a license fee of $5 per annum for each car used by the Company; latterly a payment of $600 per annum for each mile of single track used by the Company, in consideration of the City's constructing the pavement required in connection with these tracks and keeping the same in repair. There was, however, no revenue derived by the City from this mileage payment, as it was fully absorbed in satisfying the claims for which it was paid. The rate of fare charged was five cents, and tickets were sold at six for 25 cents, and 25 for $1; school tickets were also sold for the use of children, at a reduced rate. There was no system of transfer from one car to another. No night cars were run, the service commencing at about 5.30 a.m., and terminating soon after midnight. No cars ran on Sunday.

Under the terms of this franchise the City had power upon the expiration of the term limited (thirty years), to take over from the Company all the stock, plant, tools, buildings, real estate, etc., at a valuation to be fixed by arbitration, and either itself to operate the road or to re-let the franchise to the same or another Company. Acting upon this power the City determined to take over the railway, and arbitration proceedings were for that purpose entered upon. This first franchise expired upon 14th March, 1891, but as the arbitration proceedings had not at that time reached a sufficiently advanced stage to allow of the road being taken over, an extension was granted to the Company until the 16th of May. Some friction arose between the City and the Company over the amount, and the legality of the award; and possession of the stock, plant, buildings, etc., of the road was not given until the 20th of May. The amount of the award as found by the arbitrators (subject to an appeal on the part of the Company) was $1,453,788.

The stock, plant, etc., taken over by the City comprised 1,372 horses, 90 two-horse cars (closed), 56 open cars, 116 one-horse cars, 99 busses, 100 car sleighs, besides a great quantity of harness, tools and other chattels. (See Appendix "B," the schedule attached to the award.) It may be interesting to note that the stock and plant, etc., owned by the Street Railway Company in 1869 (when the concern was sold by Mr. Easton to the Messrs. Kiely), consisted of 40 horses, 12 two-horse cars, 2 one-horse cars and 4 or 5 busses.

The City began to run the street cars on 21st May, 1891. The operations were carried on under the control of the Street Railway Committee, of which Alderman Macdougal was the Chairman, with the former secretary, Mr. James Gunn, as manager, and the work was continued until the 31st of August.

In the meantime negotiations had been going on for the re-letting of the franchise to another company, which finally resulted in the acceptance of the tender of the company which now operates the system, and which is styled "The Toronto Railway Company." This company took over from the City all the stock, plant, tools, buildings, etc., received from the former company, and entered on possession and

began the operation of the system on the 1st of September, 1891. The officials of the company, as at present constituted, are:

Geo. W. Kiely.....President.
Wm. McKenzie.....Vice-President.
C. C. Woodworth.....Treasurer.
H. A. Everett.....General Manager.

In Appendix "B" will be found a copy of the conditions under which the Toronto Railway now operate the system. The salient features of these conditions are briefly as follows: The franchise extends for thirty years; the rate of fare is five cents, but tickets are sold at the rate of six for 25 cents and twenty-five for $1. A special class of cheap tickets is also sold at eight for 25 cents, to be used on the morning cars up to 8 a.m., and on afternoon cars between 5 and 6.30 p.m.; and school children have tickets at the rate of ten for 25 cents for use between 8 a.m. and 5 p.m., except on Saturdays. Night cars are run on which the fare is ten cents. Transfers are given from one car to another throughout the City, so that on payment of one fare a passenger is entitled to be carried on one continuous journey all over the routes of the system. This right of transfer is accorded simply on the word of the passenger without the issuance of any ticket (though transfer agents are placed at some crowded parts of the town), the company preferring to trust to the honesty of the citizens in this matter rather than incur the delay that would arise in issuing a large number of tickets on crowded cars, and to avoid the annoyance that might be caused to passengers from erroneous punching of tickets. Over 10,000 passengers per diem are successfully transferred. No cars run on Sunday, and cannot run until a Sunday service has been approved by a vote of the citizens. As this question was recently submitted at the polls and negatived by a large majority, it seems improbable that Sunday cars will be introduced in Toronto. The company pay to the City $800 per (single) mile of track per annum, and the City constructs the roadway, pavement, etc., in connection with the track and maintains the same in repair. One very important feature of the franchise is that the company undertake to pay to the City, as rent for the franchise, a certain percentage of the gross receipts according to the following scale, that is to say:

Upon all receipts under $1,000,000		8	per cent.
"	between $1,000,000 and $1,500,000	10	"
"	" 1,500,000 and 2,000,000	12	"
"	" 2,000,000 and 3,000,000	15	"
"	over 3,000,000	20	"

The amount that the City has received from the Company for the four months from the 1st September to the 31st December, 1891, has been:

For per centage of gross receipts	$22,967 10
For mileage of track	18,134 94
Total	$41,102 04

The amount of net receipts accruing to the City during the time that it operated the street railway, from the 16th of May to the 31st of August, 1891 (being three and a-half months), after deducting all operating expenses and allowing for interest on debentures and bank loans (see Appendix "C"), was $45,444.06. The receipts from the Railway Company under the present arrangement therefore average $10,275.51 per month, whereas, when the City operated the road, they averaged $12,984 per month, which is a most creditable showing for the City's management. It must be borne in mind, however, that the City's receipts refer to spring and summer months, whereas the Company's receipts refer to autumn and winter months.

The extent of the system operated by the Railway Company on the 31st December, 1891, was 68.41 (single) miles of street measurement. This is slightly less than track measurement over the same routes, and it is upon street measurement that the mileage payment is made. In Appendix "D" I give a detailed statement of the lengths of each street occupied by tracks.

Below is given a comparative statement showing the growth year by year since 1870 of the City's population, the railway system, the number of passengers carried, and the average number of trips made per head of the population. It will be seen from this that the steady growth of the street railway system has been very remarkable.

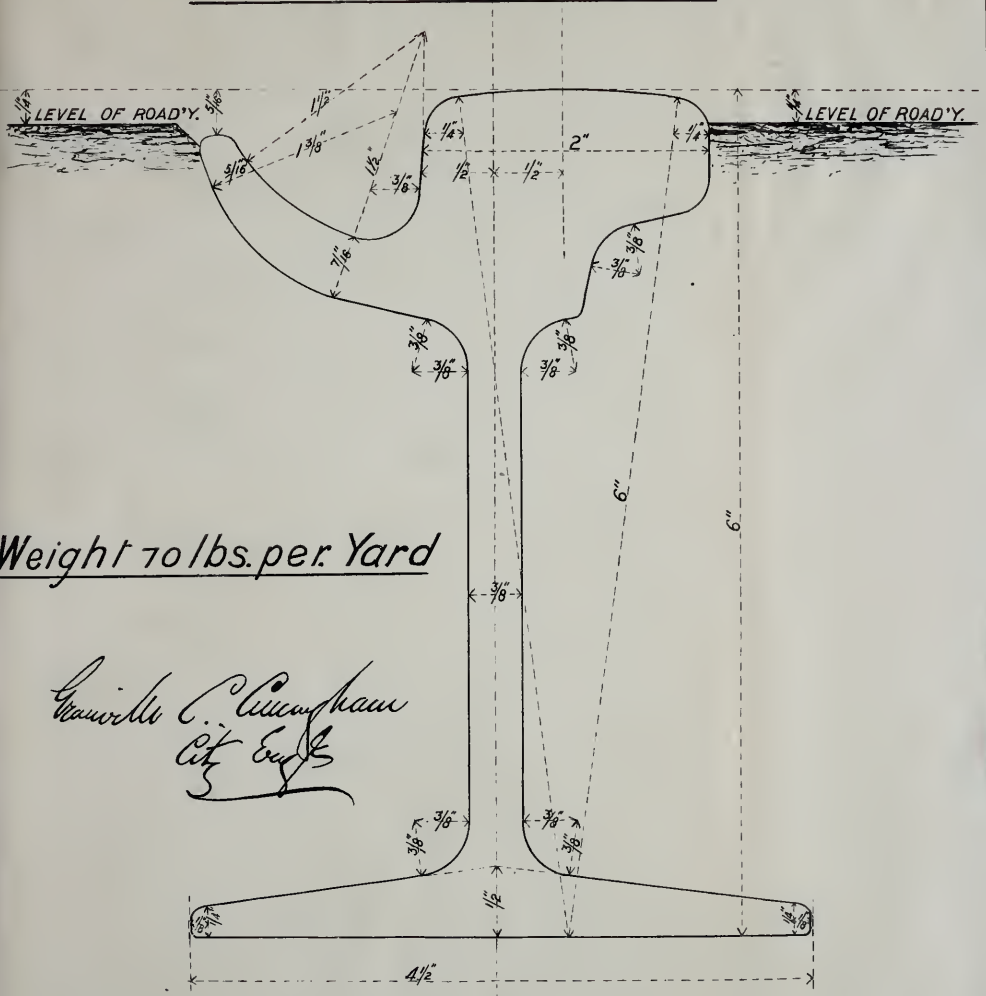
TORONTO STREET RAILWAY.

TABLE SHOWING MILEAGE OF TRACKS, PASSENGERS CARRIED, POPULATION OF CITY AND NUMBER OF TRIPS PER HEAD OF POPULATION BETWEEN 1870 AND 1891.

Year.	Total mileage of tracks laid to 31st Aug. in each year.	Number of passengers carried in each year.	Population of City for each year taken from Assessment Ret'ns.	No. of trips per annum per head of population.
1870	3.995	673,570	54,736	12
1871	3.995	912,190	57,020	16
1872	3.995	1,239,290	62,647	19
1873	3.995	1,437,545	67,995	21
1874	11.50	1,725,947	68,678	25
1875	11.50	2,161,482	71,693	30
1876	11.50	2,184,460	67,386	32
1877	11.50	2,207,482	70,867	31
1878	14.02	2,407,790	73,813	32
1879	18.62	2,299,768	75,110	30
1880	19.03	2,869,664	77,034	37
1881	22.73	3,325,428	86,415	38
1882	26.34	4,644,264	89,945	51
1883	30.53	5,142,516	102,537	50
1884	33.20	6,131,440	108,689	56
1885	37.67	7,386,208	115,210	64
1886	44.66	8,636,472	122,122	70
1887	48.12	10,545,112	130,060	81
1888	54.71	12,368,700	143,716	86
1889	62.76	14,414,960	164,986	87
1890	65.35	16,310,444	172,410	94
1891	68.72	16,618,483	188,914	88
		125,643,215		

Number of car trips in 1870 40,064
" " 1890 742,401
Car mileage in 1870 ..... 350,512 car miles.
" " 1890 ..... 4,639,353 "

STREET R'WY RAIL



Weight 70 lbs. per Yard

Granville C. Cunningham
Ass't Engr

Alexander & Cable Co Ltd. Toronto.

I also give a statement of the gross receipts, revenue and net profits for each year from 1870 to 1891. These and other particulars have been obtained from the evidence given in the arbitration proceedings *re* the Street Railway.

TORONTO STREET RAILWAY.

TABLE OF MILEAGE, GROSS RECEIPTS, REVENUE AND NET PROFITS BETWEEN 1869 AND 1891.

Year.	Total mileage of track laid to 31st Aug. in each year.	Total mileage of sts. occupied by trks for each year	Gross receipts to 31st Aug. in each year.	Net revenue for each year.	Net profits for each year.
			$ c.	$ c.	$ c.
1870	3.995	3.68	30,310 97	.....	11,225 31
1871	3.995	3.68	41,048 58	.....	13,683 28
1872	3.995	3.68	55,768 22	.....	20,879 04
1873	3.995	3.68	64,689 56	.....	26,966 32
1874	11.50	8.14	77,667 62	.....	32,706 85
1875	11.50	8.14	97,266 71	.....	34,673 81
1876	11.50	8.14	102,170 73	.....	34,292 22
1877	11.50	8.14	110,374 09	.....	36,718 64
1878	14.02	9.69	122,050 08	.....	50,748 43
1879	18.62	10.35	159,849 64	.....	47,650 74
1880	19.03	10.73	142,210 30	.....	53,645 60
1881	22.73	13.48	162,646 78	.....	52,337 25
1882	26.34	15.00	222,535 49	.....	57,464 05
1883	30.53	17.82	240,911 13	.....	60,309 57
1884	33.20	18.58	285,981 82	100,959 00	87,989 23
1885	37.67	18.71	342,745 48	123,081 00	69,095 52
1886	44.66	23.98	396,544 72	137,117 00	70,636 95
1887	48.12	25.64	482,111 70	171,533 00	96,779 06
1888	54.71	28.04	561,784 18	179,153 00	99,654 57
1889	62.76	29.61	652,702 39	204,071 00	85,288 69
1890	65.35	30.14	734,220 40	242,983 00	165,562 39
1891	68.72	33.96	747,831 74	.....	168,262 14
			$5,833,422 38		$1,376,569 66

Assets in 1870 ..... $58,340 00
" 1890 ..... $1,453,788 00

NOTE—Each year closed on the 31st of August.

Under section 24 of the Conditions of Sale of the franchise (Appendix "B") the Company are required to introduce, within one year, such system of electric or other new motor, as shall be approved by the City Engineer and confirmed by the City Council. In order

to apply this section I was directed by the Council to examine the various systems in vogue in the United States and to report. In conformity with this I made a careful examination of the whole subject in November last and submitted my report to the Council (see Appendix "E") recommending the adoption of the single-overhead-trolley-wire-electric-system as being, on the whole, that best suited to such a City as Toronto. This report has not yet been confirmed by the Council. The rail that will be used by the Company for the new system will be of a grooved pattern, similar to that generally in use in English and Continental towns, in place of the flat-strap rail hitherto used. I give a full sized drawing showing the exact section of this rail as finally adopted. The adoption of this grooved rail will be of enormous benefit to the general street traffic of the City, and it will not be more troublesome to keep clean in winter than the present rail, as experience of it during the present winter on the northern part of Sherbourne Street, where it is now laid down, has shown. (See plan of rail.)

ASHBRIDGE'S BAY RECLAMATION.

The question of reclaiming and purifying Ashbridge's Bay is still before the Council. The recommendation made by my predecessor, Mr. Jennings (in his Annual Report for 1890), that the City should do the works required for purification, has not been acted upon by the Council, but instead the offer of Col. Alexander and his associates to effect the complete reclamation and purification of the Bay, has been considered by a special committee of the Council, and its adoption, with certain modifications, recommended. I insert here a small plan of the Bay shewing what is proposed by the Alexander tender, and in Appendix "F" will be found a copy of a report which I made on this subject to the Special Committee. This reclamation is a gigantic affair, and any work that the City has ever carried out is insignificant in comparison with it. It is surrounded with legal complications, and prospective difficulties come up from almost every point of view. The work to be done is very large, comprising about twenty million cubic yards of dredging and filling, and some fifteen miles of close piling or crib protection. The cost of the work when executed would be in the neighborhood of five million dollars. I have pointed out in this report I have made, as clearly as I am able, the chief points at which the City's interests should be guarded, if this work is entered upon. I think it is beyond argument that something should be done without

delay to abate the nuisance that is caused by pouring sewage and filth into a stagnant pond such as Ashbridge's Bay, but this could be effected (and effected only) by the construction of an intercepting Trunk Sewer in the manner that has been recommended by the reports of various engineers.

If such a sewer is not constructed and the sewage is allowed to continue to flow into the Bay, the Bay will continue to be foul and polluted, in spite of reclamation works that may be carried out; on the other hand if the inflow of sewage is stopped and it is carried elsewhere, the Bay will become pure by natural processes and without any extensive works. If the primary reason for the reclamation works is to do away with the polluted and unsanitary condition of the Bay, it seems to me that the initial step should be to stop the inflow of sewage and pollution into the Bay. This very plain and simple proposition seems to have been overlooked in the discussions on this question.

TRUNK SEWER.

Since the presentation of Mr. Jennings' report, dated 30th August, 1890, upon the subject of the Trunk Sewer (in annual report 1890 Appendix "B") nothing has been done towards entering upon this much needed work. The City continues to discharge its sewage into the harbor where the citizens disport themselves in summer and cut ice in winter. It is hardly necessary to dilate upon the unwisdom of this course. Numerous reports have been made upon this subject, and Mr. Jennings' report substantially agreed with the reports that have been made from time to time by Messrs. Shanly, Brough, McAlpine and Tully, Sproatt, and Hering and Gray. The approximate cost of carrying out the whole work, according to the latest estimate, is $1,632,518.00, but an expenditure of $500,000 would suffice in the meantime and until the population of the City has considerably increased.

This outlay would cover the cost of constructing the low-level intercepting sewer with the requisite pumping station east of the Don and the discharge pipe into the lake, near Victoria Park. By the construction of this sewer the inflow of sewage into the harbor and into Ashbridge's Bay would be stopped, and these waters would become pure. There is no work that would be of greater benefit to the community at large than this, and it is much to be wished that it should be undertaken by the Corporation.

A series of current observations were made in the lake during last summer between Victoria Park and the Island, with a view to determining the set of the lake waters: but the results obtained from these are scarcely sufficiently definite to form the groundwork of a theory, beyond establishing the fact that if there be a current at all it is extremely slow and very variable.

THE ESPLANADE AND LAKE FRONT.

The vexed and complicated question of the occupation of the City front by the railways has during the past year—it is to be hoped—been brought to a final settlement and conclusion. I give here a map showing how the land on the front is to be occupied by the railways. The pink color shows the space that is to be given up to the Canadian Pacific Railway, and the blue shows the property that had been acquired by the C.P.R., but which that Company agrees to surrender to the City on condition of receiving the alternative site colored pink. The agreement under which this transfer and arrangement is effected—known as the Tripartite Agreement—is not yet signed, but it is confidently expected that it will very shortly be concluded; the only matter now delaying the signature of it being the closing of the subsidiary agreement between the Grand Trunk and Canadian Pacific Railways in regard to the extent and design of the Union Station to be by them jointly erected. The signing of this Tripartite Agreement will set at rest the troublesome questions that have so long existed between the City and the two Railway Companies in regard to the occupation of the water front. Under it the Canadian Pacific will obtain an independent entrance from the east to the new Union Station to be erected, and under it the City will obtain possession and control of the valuable property (colored blue) lying in front of the main part of the City, which, but for this agreement, would have been given up to railway freight sheds, while overhead bridges will be constructed on the lines of John and York Streets that will give access to the new street to be made to the south of the railway yard. It is to be hoped that no unforseen circumstance may arise to delay or stop the signing of this agreement. It will effect a conclusion of the question that will be beneficial to all parties concerned.

ESPLANADE IMPROVEMENT

PLAN SHEWING PROPOSED CHANGES

Blocks coloured Blue to become City Property

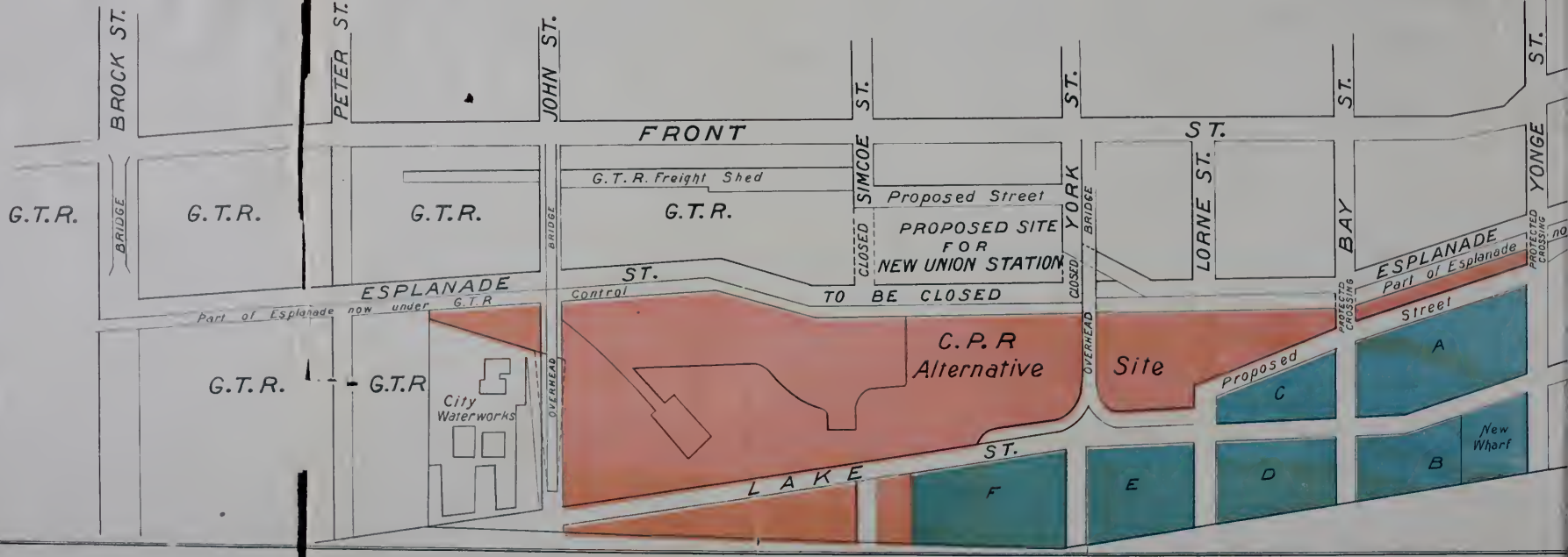
Blocks coloured Pink to be leased to C.P.R.

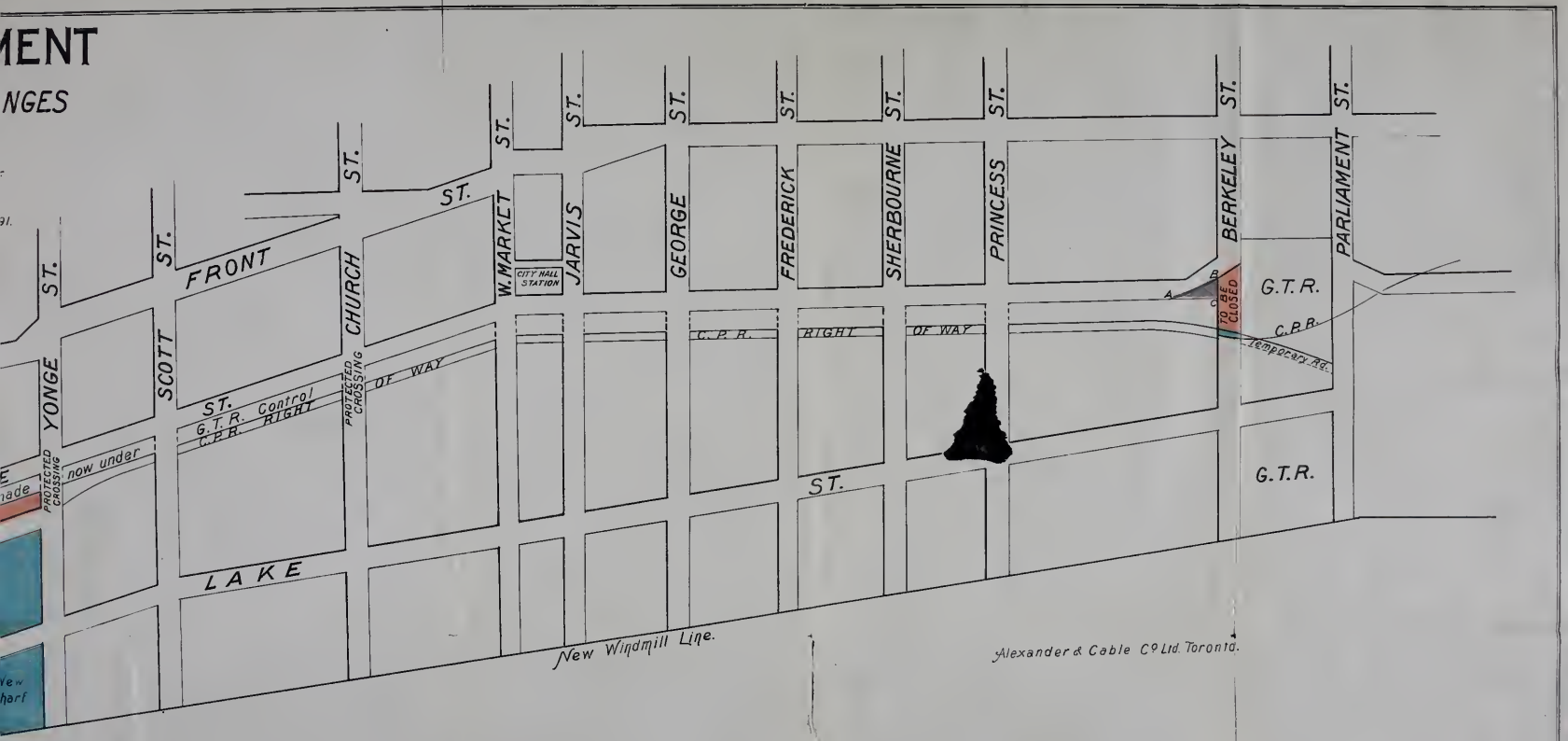
Scale 300 ft. to 1 Inch

W.T. Jennings M.I.C.E. City Engineer

Villiers Sankey City Surveyor

June 9th 1891

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CITY HALL STATION
G.T.R.
C.P.R.
RIGHT
OF WAY
TO BE CLOSED
Temporary Rd.
G.T.R. Control
C.P.R. RIGHT
OF WAY
PROTECTED CROSSING
PROTECTED CROSSING
now under
LAKE
ST.
G.T.R.
New Windmill Line.
Alexander & Cable Co Ltd. Toronto.

ENTRANCE TO HIGH PARK.

The important question of forming a proper and worthy entrance into High Park has advanced but little during the past year. The endeavor to obtain an entrance by the extension of Queen Street has failed, at least for the present, owing to the difficulty of dealing with the property owners on the proposed route. High Park was presented to the City by the late Mr. Howard as long ago as 1873, but up to the present time the City has failed to mark its appreciation of so noble a gift by opening up a suitable entrance. The park is 375 acres in extent and contains beautiful drives, paths, pleasure grounds and ornamental waters, and is a recreation place of which any City might be proud. It is to be hoped that during the present year a united effort will be made to construct an entrance that will be worthy of the City, and of value to the citizens.

WIDENING OF QUEEN STREET SUBWAY.

This work is much needed in the public interest; but the preliminary question, as to how the cost of the work shall be apportioned between the City and the Railway Companies, has yet to be argued before the Railway Committee of the Privy Council. It is to be hoped that this matter may be brought to a head during the present year, so that work may be commenced upon it.

SEWERS.

In the construction of sewers during 1891 thirty-three contracts have been carried out; of these four were brought over from 1890. These included 4 brick and 28 pipe sewers. In addition to this 22 sewers were constructed by day labor by the Department; 3 brick and 19 pipe sewers. The total length of sewers constructed during the year is 11.65 miles, and of this amount 4.53 miles were constructed by day labor. The total amount expended by the Department for sewer construction of all kinds, including special works and local improvement works, has been $268,682.86. There are now 216.68 miles of sewers of various sizes within the City limits, of which 5.98 miles are on lanes.

The following is a detailed statement of the various sewer works executed during 1891:

SEWERS BUILT BY CONTRACT.

12 in. tile pipe	8,131	lineal feet.
15 in. "	14,022	"
18 in. "	340	"
2 ft. x 3 ft. brick sewer	11,954	"
4 ft. 6 in. circular	3,144	"
	37,591	"

SEWERS BUILT BY DAY LABOR.

9 in. tile pipe	1,020	lineal feet.
12 in. "	11,294	"
15 in. "	4,995	"
18 in. "	505	"
1 ft. 8 in. x 2 ft. 6 in. brick sewer	54	"
2 ft. x 3 ft. "	1,412	"
2 ft. 6 in. x 3 ft. 9 in "	1,738	"
2 ft. 8 in x 4 ft. "	2,295	"
4 ft. x 5 ft. "	352	"
4 ft. circular steel pipe	256	"
	23,921	"

In connection with the construction of these sewers 263 man-holes and 292 gullies were built.

The following work has been done during the year by the foremen on sewer repairs:

Man-holes repaired	71
New man-holes built	204
Gullies repaired	172
New gullies built	475
Miles of sewers flushed	54

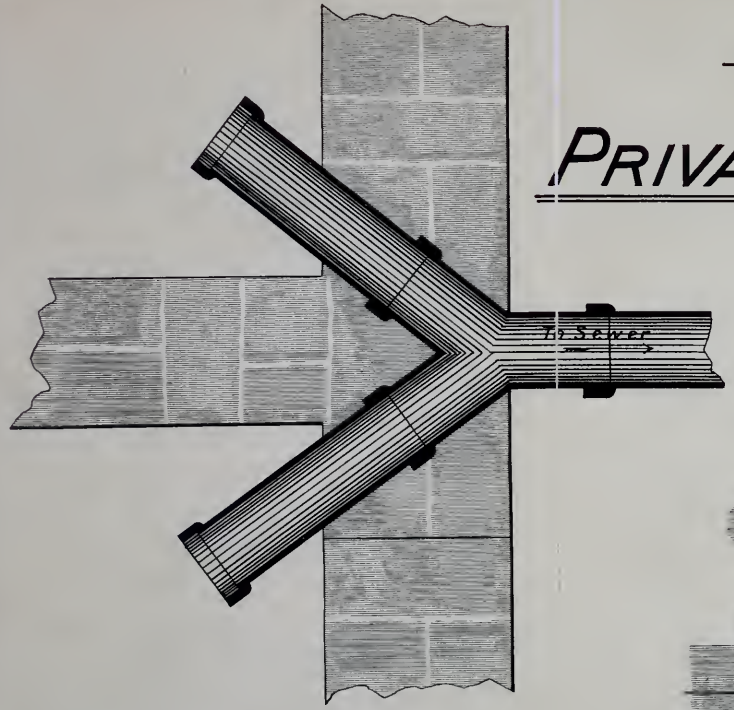
The amount expended on sewer repairs has been $62,494.78, and this is included under the head of "General Purposes" in the summary of expenditure that I have presented.

PRINCIPAL SEWERS CONSTRUCTED.

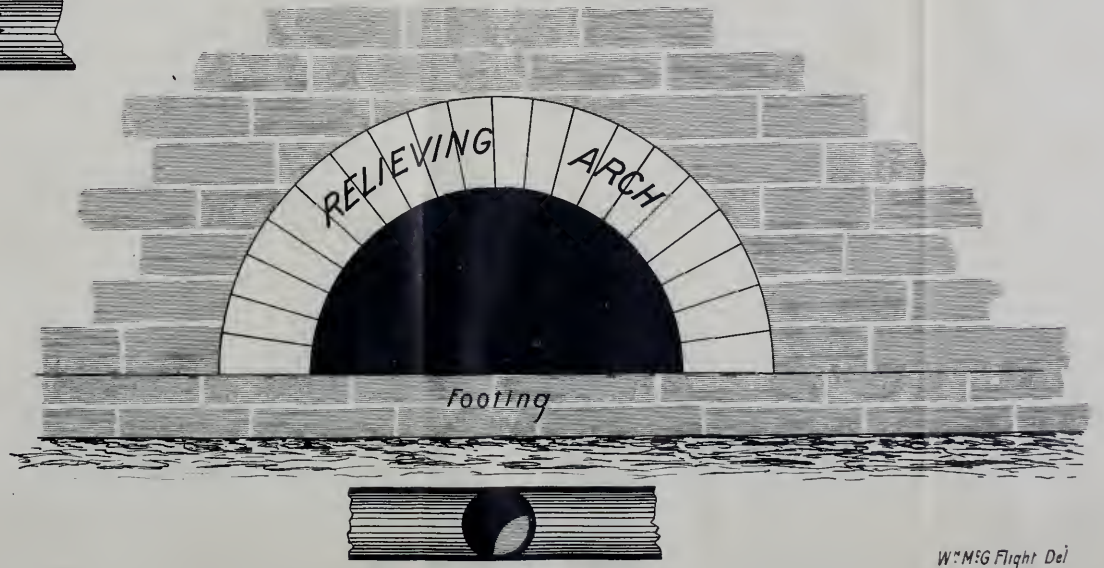
The work on the Rosedale sewer from the River Don to Yonge Street was finished during 1891. The Garrison Creek sewer was also completed between College Street and Bloor Street, and in November last work was commenced on the construction of the north-west

Plan for Connecting
PRIVATE DRAINS FOR TWO BUILDINGS.

Scale 1" to a foot.



PLAN



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branch of the Garrison Creek sewer, extending as far north as Bloor Street. Great difficulty has been experienced in carrying out these works owing to the very complicated questions that have arisen in regard to right-of-way through the various properties affected, and much time has been lost and heavy expense incurred in dealing with these.

The reconstruction of the lower end of the Jarvis Street sewer was a work that was much needed and which was carried out during last summer.

In Mr. Rust's report (annexed) will be found full details in regard to the construction and cost of sewers.

Dredging Sewage—During the year $2,254.87 has been expended upon the dredging of sewage deposit at the mouths of the various sewers emptying into the Bay. Every year this dredging is necessitated in order to keep clear the slips and to provide proper berths for vessels coming into the adjacent wharves.

Private Drains—The total number of yards of private drains constructed during the year is 11,567⅓ yards or 6.57 miles. This work is made up of 1,160 separate drains. As compared with 1890, there is a decrease of 314 in the number of drains constructed. I think the Council has acted wisely in confirming this year the system that has hitherto been adopted of constructing these private drains by day labor. Such small works as these can be better done in this manner than by contract, and better results are secured to the general public.

Plumbing Inspection—During the year 10,493 inspections of plumbing and drains were made. This is 141 fewer inspections than were made in 1890. This branch of the work has been well and efficiently done by the Plumbing Inspectors employed by the Department, and I think much good will result to the City in the future by the maintenance of a rigid system of Plumbing Inspection. An important amendment that has been made to the existing Plumbing By-law, and one that it is hoped will ensure good sanitary results and conditions in the future, is the clause making it obligatory on Plumbers to take out final certificates of inspection from this Department on any and all plumbing work done, before such work is passed and approved by the Department.

STREET CONSTRUCTION.

The following is a summary of new pavements constructed and work done in the roadway branch of the Department, under the charge of Mr. Ellis, during the year, and in whose detailed report hereafter given, will be found full particulars relating thereto:

Cedar block pavements	9.186	miles.
Asphalt pavements	1.635	"
Tamarac pavements on concrete	0.077	"
Cobble stone pavements	0.069	"
Macadam pavements	0.123	"
Grading	0.660	"
	11.75	"
Patent concrete sidewalks	1.930	miles.
Stone flag sidewalks	0.398	"
	2.328	miles.

The above statement includes all works executed by contract, day labor and private contract in the City during the year.

The approximate number of plans and drawings made in connection with these works is 180, and about 480 estimates were given containing prices for different works.

Seventy-four contracts have been carried out in the laying of various cedar block pavements and permanent sidewalks. Of these 19 were brought over from 1890 and 55 were let in 1891. These include 32 cedar block, 8 asphalt, 1 cobble stone, 13 concrete sidewalks and 1 stone flag sidewalk.

In addition to the above, 21 works were executed by day labor, and several private contracts were superintended by the Department.

I give below a statement showing the mileage of the various kinds of pavement at present laid down in the City, together with the total street mileage and the area of the City for the years 1881 to 1891 inclusive. This shows that while in 1881 there were only $3\frac{1}{2}$ miles of cedar block pavement, there are now $116\frac{3}{4}$ miles of that class of pavement in the City. At the same time the total street mileage has grown from $116\frac{3}{4}$ miles to $250\frac{1}{2}$ miles, while the area of the City (exclusive of the Harbor, Island and Ashbridge's Bay) has almost exactly doubled. The facts set forth in such a statement as this show in a most concise manner the growth of the City and the large amount of

work that has been done during the past decade. There are still 89½ miles of unpaved streets in the City which will require the attention of the Department before long.

STATEMENT SHOWING THE DIFFERENT CLASSES OF ROADWAYS AND THE MILEAGE OF SAME FROM 1881 TO 1891.

Year.	Cedar Block.	Stone and Scoria.	Asphalt.	Wood on Concrete.	Macadam.	Unpaved.	Total Mileage.	Total acreage not including Harbor, Island or Ashbridge's Bay.
1881	3.51	0.03	....	....	50.92	62.39	116.85	5,236.6
1882	13.41	0.03	....	....	48.28	55.13	116.85	5,236.6
1883	26.90	0.03	....	....	54.57	54.07	135.57	5,236.6
1884	33.76	0.25	....	....	52.32	76.77	163.10	8,128.0
1885	39.84	0.25	....	....	50.17	75.98	166.24	8,128.0
1886	48.99	0.36	....	....	47.36	72.18	168.89	8,128.0
1887	64.11	0.36	0.07	....	45.14	59.21	168.89	8,494.5
1888	79.55	0.36	0.25	....	42.76	49.87	172.79	9,705.7
1889	92.39	0.36	3.36	....	38.65	107.43	242.19	10,355.9
1890	109.57	0.36	5.08	....	36.63	90.55	242.19	10,391.2
1891	116.83	0.59	6.66	0.49	36.39	89.44	250.40	10,391.2

Besides this large mileage of streets there are also 82¼ miles of lanes in the City, only a very small part of which (2¼ miles) is paved.

With regard to the paving of streets, I give below a table showing the percentage of the various classes of pavement that is now in the City. From this it will be seen that very nearly one-half is composed of cedar block, and about one-third is entirely unpaved.

TABLE SHOWING THE VARIOUS CLASSES OF ROADWAYS IN THE CITY OF TORONTO, AND THEIR RELATIVE PERCENTAGE.

Class of Pavement.	Mileage.	Percentage.
Cedar Block	116.83	46.66
Asphalt	6.66	2.66
Macadam	36.39	14.535
Stone and Scoria	.59	.235
Wood on Concrete	.49	.19
Unpaved	89.44	35.72
Total	250.40	100.00

It is very important that the paving of streets should be proceeded with as rapidly as circumstances will admit, and particularly important that the lanes of the City should be properly drained and paved. The lanes are a frequent cause of unsanitary condition, owing to their not being kept properly clean, and one of the first steps in the making and keeping of them cleanly is to drain and pave them. A thorough policy in the treatment of these lanes should be adopted by the Council and adhered to until all the lanes of the City are placed in a good and sanitary condition, in which, by a little cleaning from time to time and at a very small cost, they can be kept.

In the map of the City, inserted as a frontispiece to this report, I have shown by different colors the various kinds of pavement now in use in the City. This map shows at a glance those parts of the City where paving work in the future is most needed. It will be seen that the great proportion of macadam streets (green color) is gathered in the central and older part of the City, while the cedar block is to be found in the outlying and more recently acquired parts. The macadam roads are for the most part in very poor condition, and are a source whence mud and dirt in large quantities are brought on to other streets of the City. During the past year some of these macadam streets were repaired with lake gravel with good effect; but this kind of road-bed is not suited for the heavy traffic of a large town, and should be replaced by other material whenever opportunity offers.

In regard to the paving work that has been done by day labor, it is gratifying to be able to show that it has been most efficiently and economically performed. Mr. Ellis, in his report hereafter given, gives some details in regard to the work at the King Street subway, showing that it has been very cheaply done, as compared with the cost of contract work of a similar class. Very complete details of this work were prepared for and submitted to the Special Committee of the City Council that was appointed to investigate the whole matter, and from these details I give below a statement showing the exact cost of the concrete base, of the granite paving, and of tamarac paving per square yard. These statements of cost are given in such detail that the information they afford may prove interesting.

DETAILS OF PORTLAND CEMENT CONCRETE LAID BY DAY LABOR AT THE KING STREET SUBWAY FOR THE PAVEMENT, IN 1890-1891.

14,579 square yards laid, 6 in. thick = 2,430 cubic yards.

MATERIAL USED :			Proportions.
1,885.7 barrels Portland Cement =	269	cubic yards.....	1
Broken Stone.....	2,037	"	$7\frac{1}{2}$
Gravel and sand.....	648	"	$2\frac{1}{2}$
	2,954		

DETAILS OF COST :			Per square yard.
Cement, 1,885.7 barrels at $2.77\frac{3}{4}$.....		$5,237 62	$0.358
Broken stone, 2,037 cubic yards, $1.91..... ..		3,481 56	0.238
Gravel, 648 cubic yards, $0.80.....		518 24	0.036
Labor laying (15 cents per hour)		2,511 63	0.173
		$11,749 05	0.80\frac{1}{2}$

DETAILS OF THE COST OF GRANITE SETT PAVEMENT AT KING STREET SUBWAY, 1890-1891.

2,054 square yards of Granite Pavement laid.

MATERIAL USED :			Per square yard.	
45,895 setts.....	$3,825 11			
Hauling and unloading same....	229 30			
	$4,054 41		$1 97	
Gravel, 107 cubic yards	85 57		0 04	
Cement for grouting.....	165 72		0 08	
		$4,305 70		$2 09
LABOR :				
Grading.....	$379 10		$0 $18\frac{1}{2}$	
Laying, grouting, etc.....	505 41		0 $24\frac{1}{2}$	
		884 51		0 43
CONCRETE BASE :.....		1,655 29		0 $80\frac{1}{2}$
		$6,845 50		$3 $32\frac{1}{2}$

DETAILS OF TAMARAC PAVEMENTS.

3706 square yards of Tamarac (square blocks 4 in. x 8 in. x 7 in. deep).

MATERIAL :			Per square yard.	
221,265 ft. B.M. of 4 in. plank.	$2,967 29			
Cutting and hauling same	317 50			
	$3,284 79		$0 $88\frac{1}{2}$	
Laths, 27,000.	51 30		0 $01\frac{1}{2}$	
Gravel, 226 cubic yards	180 75		0 05	
Cement for grout, 120.41 barrels	342 80		0 $09\frac{1}{4}$	
Finch's preservative	297 83		0 08	
		$4,157 47		$1 $12\frac{1}{4}$

			Per square yard.
Labor :			
Grading	$684 03		$0 18½
Laying grouting, etc	1,278 98		0 34½
		1,963 01	—— $0 53
Concrete Base :		2,986 62	0 80½
		$9,107 10	2 45¾

These statements of cost are low in comparison with the prices paid to contractors for similar work (see Mr. Ellis' report) and the work done by the Department is first-class in every particular. There has been developed in the Council a strong opposition to the doing of work by the Department by day labor, based chiefly on the quite erroneous statement that the work is more costly than by contract. The statements of cost that I have produced entirely refute this, especially in regard to the paving work at the King Street subway. This doing of work by day labor gives an immense additional amount of clerical and office work to the Department, as will readily be understood, and if the Council desires it, the Department can easily give up doing the work in this manner; but, at the same time, I wish the Council to understand that the work that has been done by the Department in this way, has been both cheaply and efficiently done, and has saved the City and the ratepayers a very large amount of money.

The total amount expended upon pavements during the year is $384,011.22, as compared with $518,716.77 for the previous year. Full details of all these matters of cost of pavement construction are to be found in the statement of accounts. (Appendix "A.")

STREET CLEANING AND REPAIRS.

The whole subject of street cleaning is very fully dealt with in Mr. Jones' report hereafter given, which shows the amount of work done and the cost thereof.

1,925 miles of streets have been cleaned during the year, at an average cost of $29 per mile, which covers the cost of crossing cleaning and the gathering and removing of all refuse from the streets from kerb to kerb, as well as channeling.

I think the members of the Council and the public generally will agree with me that during the past year the streets of the City were kept in a cleanly and creditable condition, and that the City never looked better in that respect than it did during that

time. Mr. Jones has perfected the horse-sweepers under his charge and is confident of being able to improve the appearance of the City, as far as street cleanliness is concerned, still further and at less cost.

A very large amount of work has been done in the matter of renewal of pavements, and the remarks made by Mr. Jones in his report should receive the strong endorsation of the Council, as they do from me. In the estimates for 1892 I have asked for the sum of $40,000 to be expended in renewing about 11 miles of the worst of our cedar block pavement, and I trust that this sum will be placed at the credit of the Department for that purpose. A reference to the table I have given, on page 27, will show that up to the end of 1882 there had been constructed 17 miles of cedar block pavement; so that it is only to be expected that a large portion of this should now require renewing.

The repairing of streets should also be diligently attended to, so as to maintain them in proper order. I think the adoption of a more permanent style of paving, with a concrete foundation, for our main streets, will have a beneficial effect in the future, as it would reduce the cost of repairs.

WOODEN SIDEWALK CONSTRUCTION BY DAY LABOR.

During the year about 31.34 miles of wooden sidewalks have been constructed as local improvements, full particulars of which will be found in the Accountant's Statement, Appendix "A." The total length of wooden sidewalks now in the City is about 416 miles.

The following table shows the cost per lineal foot of constructing the different classes of wooden sidewalks by day labor during the past year:

		Per Lineal Foot.
Sidewalk,	4 feet wide	22 cents
"	5⅓ "	26 "
"	6 "	31 "
"	10 "	46 "
"	12 "	59 "

STORE DEPARTMENT.

In Appendix "A" will be found a detailed statement of all material that has passed through the Store Department during the year. This Department was established by Mr. Jennings in 1891, and

has proved extremely useful in connection with day labor work. It is absolutely necessary, when carrying on works by day labor, that the material to be used should be carefully handled and properly checked in the issuing of it to the various works. An examination of the statement will show that the Storekeeper has handled very large quantities of material; and when handled in this manner, the Council and the Department have the satisfaction of knowing that everything used can be accounted for.

While the above remarks were being prepared for the press, the death occurred of Mr. G. W. Strange, the Storekeeper for the Department. It is with deep regret that I record this sad event. He was a painstaking and most worthy official, who did his duty faithfully and always had the interest of the City at heart. He died on the 20th of March, at the early age of 43.

SURVEY DEPARTMENT.

The report of the City Surveyor, Mr. Sankey, shows that a large amount of work has been done by him during the year. The City plan, which is being prepared in his office, will be a very valuable and useful work. It is of great importance that the City should have in its possession an accurate plan of all property in the City, and one that can be relied on by the Assessment Commissioner and the City Treasurer in matters of measurement; and such a plan Mr. Sankey is preparing. I give below a statement showing the acreage of the City at various dates, exclusive of the acreage of the harbor and Ashbridge's Bay. This statement shows how rapid has been the City's growth in the short time represented by the different years.

STATEMENT OF AREA OF CITY DURING YEARS 1834 TO 1890.

(This is exclusive of the Island, Harbor and Ashbridge's Bay areas.)

	Acres	Total Acreage.
Original area, 1834 to 1883	5,236.6	5,236.6
Added in 1883, Yorkville	543.6	
	5,780.2	5,780.2
" 1884, east of Don	1,318.9	
" 1884, Brockton and High Park	1,028.9	
	8,128.0	8,128.0
" 1887, Rosedale	99.	
" 1887, Northern Annex	209.7	
" 1887, N. of Queen St. and E. of Greenwoods Av.	57.8	8,494.5
	8,494.5	

	Acres.	Total Acreage.
Added in 1888, north of Yorkville	49.7	
" 1888, north-west of Yorkville	17.	
" 1888, west of Parkdale	91.6	
" 1888, north of Brockton	1,052.9	
		9,705.7
	9,705.7	
" 1889, Parkdale	650.2	
		10,355.9
	10,355.9	
" 1890, east of Greenwoods Avenue	35.3	
		10,391.2
Total	10,391.2	

Total City area, 10,391.2 acres, or 16.2 square miles.

BRIDGES.

While no very extensive works have been carried out in bridge construction during the year, yet the report of Mr. Williams, Engineer in charge of bridges and special work, which is hereafter given, shows that a considerable amount of work has been done in this branch of the Department.

It is to be hoped that the high-level swing bridge on the line of Queen Street, across the Don, may soon be undertaken, plans of which are prepared and are in the Department. But considerable preliminary discussion must first be had before the Railway Committee of the Privy Council at Ottawa, in order to settle many points now in dispute in regard to the apportionment of the cost between the Railways, the City and the property owners concerned.

The construction of a new bridge at Winchester Street, crossing the Don, at the easterly terminus of the Rosedale Ravine, is also a matter that should receive the attention of the Council at once.

The total amount expended on bridge repairs during the year, is $5,279.19, which is an increase of about $4,750 over the previous year.

GENERAL.

The Water Works Department of the City is under the management of Mr. Wm. Hamilton. The water supply is obtained from Lake Ontario, and its quality cannot be surpassed. The direct pumping system is used, with reservoirs at the high parts of the City. The pressure at the lower levels averages about 80 lbs., which gives ample force for fire purposes. There are 238 miles of mains throughout the City, 2,708 hydrants and 1,861 stop-valves.

With an ample pumping power, Toronto has at its command a most perfect supply of the best water.

RAILWAYS—The total mileage of steam railway tracks within the City limits is made up as follows :

Grand Trunk Railway, about	55	miles.
Canadian Pacific Railway, about	23.24	"
Total	78 24	"

GAS, ELECTRIC LIGHT, TELEGRAPH, TELEPHONE, ETC., — The lighting of the City is effected by the Consumers' Gas Co., the Toronto Electric Light Co., and the Toronto Incandescent Electric Light Co.

The works of the Consumers' Gas Co. at present consist of three full sets, two for coal and one for water gas, with a combined manufacturing capacity of 3,125,000 cubic feet per diem. while there is spare room in the building sufficient to enable the company to supply, if required, 6,000,000 cub. ft. of gas per diem. There are five gas holders of a combined capacity of 2,125,000 cubic feet. The total output of gas for the year ending 31st September 1891, is 509,414,000 cubic feet. The number of miles of mains laid up to that date is 207 ; the number of meters in use, 14,838 ; number of services laid, about 14,838. There has been a large decrease in the number of gas lamps on the streets of the City as compared with the number in use in 1890, owing to the general adoption of electricity for street lighting. During the year 1,578 new services were laid in and nearly 14 miles of new mains were laid down. The candle power of the gas supplied, as shown by the Government Inspector's report, has been increased from about 17½ during the preceeding years to 21 candles.

Many of our City streets are made unsightly by the vast number of telegraph and other poles of various descriptions which are still on them. As the Telegraph, Electric Light, Telephone and other companies within the area bounded on the south by the Esplanade, on the west by Spadina Avenue, on the north by one block north of Queen Street, and on the east by George Street, are bound by By-law 2767 to remove their poles from the City streets, and place their wires, within this district, under-ground by the end of the year 1894, it is evident that in the meantime a great deal of energy must be displayed in order to get the poles removed and the wires

placed under-ground in that time. The vast net work of over-head wires in some of our main streets may prove a fruitful source of difficulty and danger in the event of fire, and there is scarcely a street but the ill effect is noticeable from their existence. The Council should consider and determine upon means to force the companies concerned into making an earnest effort to get their poles off the streets and their wires under-ground at once.

The Toronto Electric Light Company — Have about 350 miles of over-head wire strung throughout the City, diverging from their central station on the Esplanade at the foot of Scott Street, which supplies current for 960 street Arc lamps and about 350 commercial Arc lamps, besides low tension current for the supply of motive power. The wires are at present strung on poles, some of which are used by the Fire Alarm System and the Police Patrol System, as well as by the telegraph companies. The company have patented and are engaged in perfecting a system of under-ground conduit, which they propose to lay down in conjunction with the laying by the City of permanent pavements on the streets, which will carry the wires that are at present strung over-head. The company are completing large additions to their works, which will give an additional capacity of 2,000 H.P. to the 2,000 H.P. already in use. The whole of the plant, including engine, boilers and electrical machinery will be manufactured in Toronto. The electrical equipment is made in the company's own shops here, where a large force of machinists is constantly employed.

The Toronto Incandescent Electric Light Company—Have at present about 25 miles of electric under-ground tube laid in the City, and as each tube carries three heavy copper wires, their present mileage of under-ground wire laid and in use is about 75 miles. The Company propose to lay 10 miles additional under-ground conduit during the coming year. At present current is supplied to 12,000 lamps distributed among 450 customers.

The Great North-Western Telegraph Company—Have 17 miles of poles in City limits, which support over 300 miles of wire strung over-head. They have 37 branch offices in the City, the head office being at the corner of Scott and Wellington Streets.

The Canadian Pacific Telegraph Company—Have 17 miles of poles in City limits, which support about 108 miles of wire strung

over-head. They have 35 branch offices, 90 sets of instruments, and 1,000 call boxes distributed throughout the City. The head office of the Company is in the Board of Trade building.

The Bell Telephone Company—Have their headquarters in Montreal, with a branch here, and from the manager of this branch, Mr. Dunstan, I have been furnished with the following statistics. As an essential feature of their reconstruction work in the central portion of the City, they have erected a new and central Telephone Exchange building on Temperance Street, at a cost in the neighborhood of $60,000, and it is in every way a thoroughly satisfactory, substantial and fire-proof Telephone Exchange. During the past five months the Company have moved their Yorkville branch to the south-east corner of Yonge and Bloor Streets, and have now at that place a thoroughly modern Exchange, equipped with a metallic multiple switch-board capable of serving 3,000 subscribers. The wires are all brought in under-ground to this office to cable terminals which are supplied with the best lightning and electrical arrestors. In order to carry out this under-ground service and comply with the terms of their agreement with the City, the Company have placed a number of poles on side streets and alley-ways, have strung over 300 miles of wire, 300,000 lineal feet of aerial cable, and have brought into use over 31,830 feet of under-ground cable. They have supplied "second" wires to about one-sixth of the total number of subscribers in Toronto, thus giving them the great advantage of quiet metallic circuits, free from the noise caused by electric induction. While this work of moving the Telephone Exchange has been going on, the Company on an average have put in about 100 new connections a month, each one of which necessitates the erection of outside line and interior wiring. There are now laid in Toronto 16,183 lineal feet of this Company's under-ground conduit, which contains 310,537 feet of duct, each duct being intended for one cable. This amount is made up as follows: 64,857 feet 2½-inch Macdonald duct; 55,312 feet 3-inch Macdonald duct; 190,368 feet 3-inch Wychoff duct, all of which is made of a specially prepared creosoted wood imported from the United States, and in such a manner as to exclude all moisture from the cables. Forty-seven man-holes, six feet square, have been constructed in connection with this conduit system, besides the large area in front of the Company's Central Exchange on Temperance Street, which affords access to this under-ground system. In order to move into

their new building on Temperance Street, and work the new metallic system, and otherwise comply with the terms and conditions of their agreement with the City, the Company have to lay about 1,400 feet of conduit, equalling 162,500 feet of duct, and for this they purpose using cement-lined iron pipe, which, though considerably more expensive than creosoted wood, will, it is believed, be more durable and satisfactory. When this is done the Company will be able to remove 784 of their poles from the streets, which now carry 3,867 cross-arms and about 1,300 miles of wire. This new construction work will necessitate an expenditure for under-ground metallic line of between $175,000 and $200,000; and besides this there will be the work of erecting new distributing routes on the side streets, and building "second" lines to the 3,000 subscribers not yet having a metallic service, and the re-wiring of the interior of each one of these 3,000 dwellings or offices. Besides all this there is the moving of the main Exchange and the setting up of a complicated switch-board capable of accommodating 5,000 subscribers. This switch-board is now being manufactured at the Company's shops in Montreal, and will be of iron frame board of the most modern description, and will cost in the neighborhood of $50,000. The Company have also to duplicate the construction work done in Toronto during the past twelve years, and complete it inside of the next two years. The Company have now 3,843 subscribers in Toronto, and they are about combining the Toronto Junction service with that of the City, and they also purpose building another branch Exchange at the eastern end of the City. The Company also now have in use 3,406 miles of over-head wire, strung on 97 miles of poles.

FIRE ALARM TELEGRAPH SYSTEM.

The Fire Alarm Telegraph System is controlled by the City, and is under the superintendence of Mr. Donald Gibson. It is a ten-circuit, automatic, non-interfering and repeating system, with galvanometer switch-boards and appliances in head office for testing lines and locating trouble. The line consists of 71 miles of wire strung on 38 miles of poles, 15 miles of which belong to the City, and the remainder to the Telegraph, Telephone and Toronto Electric Light Companies. The line is divided into nine circuits, all centring at Lombard Street Fire Hall, and communicating with 29 gongs situated in the different Fire Halls and residences of the chief officials of the Fire Department. There are 154 fire alarm boxes, 5 bell strikers, 16 alarm gongs and 5 fire alarm bells.

CONCLUSION.

Before concluding this Report I would like to avail myself of this opportunity of putting before the Council a few general considerations in regard to the position of City Engineer, which I hope may not be without value. The almost chronic friction that exists between the City Engineer and the Council, and the ever recurring trouble that arises in the Department of Works, form reasonable grounds for my touching upon this subject with a view to discovering their cause and effecting their removal. The three years' experience that I have had in the employment of the City Engineer's Department, have given me opportunities of observing facts and of drawing conclusions that may be of use in the future.

The City Engineer is, by the By-laws of the City, placed in a position of extraordinary power and authority. There is no work or improvement in the City that can be undertaken except upon the recommendation of the City Engineer. If he refuses to recommend, the Council is unable to act, and the work cannot proceed. Though the Council has the power of vetoing recommendations made by the Engineer, yet the Engineer has the power—distinctly conferred upon him by By-law—of refusing to recommend any work, even though asked for by resolution of Council, or by petition of citizens. The agreement under which the Street Railway Company works, places the control of this very important undertaking largely in the hands of the City Engineer. No extensions of the system can be made unless recommended by him and approved by the Council. (See Appendix "B.") The Engineer, therefore, while he is an employe of the Corporation, is placed in a position of co-ordinate authority with the Council, and must in many instances exercise a controlling authority over the Council. When the question of doing any particular work is brought forward, whether by petition, resolution, or otherwise, it must necessarily be referred to the City Engineer. If he says, "I will not recommend," the whole project is at once brought to a stand, and there is no means by which it can be advanced further. The result is that the Engineer draws upon himself the attack of those who desire that the work should proceed. If on the other hand he says "I recommend this," there is at once aroused the bitter opposition—and every scheme has its opponents—of those who do not desire to see the work done. And this opposition is directed against the Engineer personally—not against those who may have petitioned,

or moved the resolution for the work. The opponents see that their point of attack must be the Engineer's recommendation; if they can break this down their victory will be secured. Their views are championed in Council by Aldermen, who are of the same way of thinking, and out of Council by the press as it may take sides on the question. If the attack were always fair but little objection could be raised, but too often it is made quite personal, and in order to gain their own ends, the Engineer—while acting with absolute honesty and impartiality, and with correct engineering skill,—is represented as being both incapable and stupid, and tactics that cannot be too severely condemned are adopted in the endeavor to gain the object in view. And the stronger and more impartial the Engineer is, the more bitter and rancorous is the attack. While this is the action of those opposed to the recommendation, those in favor of it do little in the way of active support of the Engineer.

Now, I think it must be apparent to all, upon very little reflection, that no man can possibly remain long in such a position of constant harassment. What he must have, in order to do his work well by the City, is a strong and manly support from the Council. If the Council places upon him this heavy burden of authority, and puts him forward constantly to bear the brunt of attack, the Council should be prepared manfully to stand by him and support his official acts. If the Council has confidence in its Engineer, it should plainly and resolutely support him; if it has no confidence in him, the sooner it replaces him by a man it can trust, the better. But it is manifestly unfair and unwise to place him in a position requiring and demanding the exercise of his personal authority, and then not only attack him for the use of that authority, but to seek to tie his hands and warp his action by cramping and narrowing resolutions that practically destroy his power. If the power is conferred, the Engineer should be supported in the exercise of it; if the Engineer should not have the power, the By-laws of the City should be altered, and the mode of carrying on work in the City placed upon a different basis. I respectfully submit that in fairness and in reason either one course or the other should be followed.

All of which is respectfully submitted.

GRANVILLE C. CUNINGHAM,
City Engineer.

CITY HALL, April 5th, 1892.

CITY SURVEYOR'S REPORT.

CITY ENGINEER'S OFFICE,
Toronto, December 31st, 1891.

G. C. CUNINGHAM, ESQ., *City Engineer:*

DEAR SIR,—During the past year the following are among the most important matters that this Department has dealt with: Esplanade Improvement and Water Front question; entrances into High Park; Queen Street west extension; College Street extension: Dundas Street bridges; Garrison Creek sewer; Rosedale Valley Road; extension of the Western Cattle Market; Davenport Road widening; Oscar Street opening; besides many surveys and searches in the Registry Office connected with work such as Barton Avenue extension, College Avenue extension, renewal of Hanlan and Heber leases (on Island), Market Block leases, and the defining of the boundaries of various streets in the City.

The preparation of the City plan has been steadily carried on and satisfactory progress made thereon.

In the matter of lands acquired by the City for the opening of roads by dedication or otherwise, and for the construction of sewers or other similiar purposes, I have found great difficulty in obtaining the plans referred to, where the transaction took place some years ago. As I cannot find that they were regularly filed in any one office, I have therefore opened a Register for plans of this nature, and in some cases I have succeeded in obtaining the original plan; in other cases I have had to be satisfied with a copy, but in many I have not been able to get any. In order that the usefulness of this Register may be fully maintained, I would suggest that all land plans, for whatever purpose required, should be filed in this Department.

In the matter of registered plans, the amendment of the Registry Act of last session of the Ontario Legislature works very satisfactorily. By this amendment, all persons filing plans. of subdivisions in the Registry Office, are compelled to deposit at the same time a duplicate. The Registrar (at the request of the City Treasurer) hands these duplicates over to me, and I have them properly filed away and deposited in my vault, with a proper index whereby any plan can be

readily found. I have also had prepared a list of all registered plans in the City, which will prove very useful not only to this Department, but also to the Assessment Commissioner, the Treasurer and City Clerk.

I will refer at more length to some of the matters above mentioned, so that this report may take the form of a record for future reference as to the circumstances and conditions under which these now rest.

I will refer to the Esplanade and Water Front question first. At the beginning of the year the matters were in this position.

The G.T.R. and C.P.R. had both positively stated that the solution of the difficulties by the proposed "Viaduct Scheme" was impracticable, and the "Jennings Alternative" scheme had been submitted to the Companies. The principal features of this scheme were the locating of the C.P.R. yards on the lands south of the Esplanade, extending from John Street on the west to Lorne Street on the east, with the right-of-way thereto fanning out at both ends to permit of a fuller use of the lands for yards, tracks, etc., the City to retain the lands lying easterly from the above site to Yonge Street.

The above scheme did not interfere with the construction of Lake Street, as contemplated by the Wind-mill Line Agreement, to its westerly termination at the foot of John Street (see plan). The only step however which had been taken towards the carrying out of this scheme was a conference with Mr. Van Horne, at which a plan showing the idea generally was submitted; this was afterwards followed by a letter from Mr. Van Horne to the City Solicitor, making certain proposals. On careful consideration the proposals contained in this letter were found to amount to an offer to accept the "Alternative" site in lieu of the "Original," or Yonge-York Streets site in the way of an exchange of lands, thus: the C.P.R. having already acquired all the interests in the Yonge-York Streets site except the City's, the City was to acquire the outstanding interests in the Alternative Site and then the two sites were to be exchanged, the C.P.R. to pay the City an annual rent for the "Alternative" site, based on the value of the Yonge-York Streets site. On February 18th an interview was had with Mr. Van Horne at which the letter was discussed, when it was decided to open negotations with both Railway Companies, having in view the making of an agreement on the basis of the above letter.

After many interviews at Toronto, Ottawa and Montreal, the "Tripartite Agreement" was finally settled subject to the ratification of the City Council, and the Board of Directors of both Railway Companies.

This agreement, besides making provision for the exchange of sites above mentioned, also provides for the erection of a new Union Station, generally on the site of the present one, for the construction of iron and steel viaducts on John Street and at the east side of York Street, for the protection by the Railway Companies of the crossings on Bay, Yonge and Church Streets, and for other matters incidental to the whole matter. The plan accompanying fully shows the entire proposals.

The "Tripartite Agreement" was reported to Council and adopted on June 12th, 1891.

On July 16th, 1891, the qualified ratepayers voted for the passing of a By-law authorizing the issue of debentures for $300,000 to cover the City's share of the cost of carrying out the agreement. This By-law passed the Council on July 27th, 1891, and the officers of the Council were authorized to carry out the terms of the agreement and to execute all necessary documents.

It is greatly to be regretted that owing to delays on the part of the railway companies the agreement is still unexecuted.

A few words here may not be out of place with regard to the results as affecting the City's interests, should the agreement be carried out.

Under the "Original" or Yonge-York Streets site the portions of the water front most suited for passenger and light traffic would have been occupied by the C. P. R. yards, thereby cutting off the portion lying between Simcoe and John Streets, which in time would also have been absorbed, as it would be rendered totally unfit for any other purpose.

Under the "Alternative" site the portions of the water front lying from Yonge to York Street will be retained by the City, having all encumbrances such as leaseholds, etc., removed; and this latter circumstance is by no means unimportant, as the existing leases extend from three to sixteen years.

These blocks, colored blue on plan, will be the proper location of all ferry and passenger wharves which will be in demand when the

improvements are carried out, as the only other block devoted to similar use is the one from Yonge to Scott Street.

The business on our water front will then be divided as follows From Queen's Wharf to Simcoe Street, railway and elevator business, except Water Works Wharf; Simcoe to Scott Street, boat houses and clubs, passenger and ferry business; Scott to Parliament Street, general business, coal, stone, gravel, ice, etc.

With regard to the Rosedale Valley Road, a considerable amount of land has been acquired and negotiations are going on for the rest. When this is complete the City will be able to make a most beautiful drive through this valley, which I believe is almost unknown to most of the citizens.

The various sites which were chosen for a Rifle Range, were submitted to the Military Authorities to select the most suitable; but owing to the difficulty of transport, which is now being arranged, the matter is not yet decided.

The Western Cattle Market is practically complete, the Dominion Government having made arrangements to dispose of the old Emigration building and premises to the City, and the land will soon be in condition for use. This will double the usefulness of the present yard and the C. P. R. and G. T. R. can do business then on an equal footing.

During the year the sheets of the City plan, which cover those portions of Division No. 6 (formerly Parkdale and Brockton) and part of Division No. 1, have been finished. In these localities a good deal of survey is necessary to adjust differences between old and new Registered plans; but in order to get the whole plan on paper as soon as possible, I am now only doing so much survey as is absolutely necessary, leaving the rest to be finished on the final revision. I have received many assurances of the usefulness of the plan, as far as finished, from the Registry Office, the Assessment Department, the City Treasurer, and City Clerk.

The other matters mentioned in the beginning of this report, having come more particularly before you, need not be referred to by me.

Yours truly,

VILLIERS SANKEY,

City Surveyor.

SEWER ENGINEER'S REPORT.

CITY ENGINEER'S OFFICE,
Toronto, December 31st, 1891.

GRANVILLE C. CUNINGHAM, ESQ.,
City Engineer:

DEAR SIR—I beg to report as follows on the operations of the Sewer Department, for the year ending 31st December, 1891:

During the year 11.65 miles of sewers have been constructed, of which 7.12 miles were constructed by contract, and 4.53 miles by the Department on the day labor principle.

The following is a description of the different kinds of sewers constructed, with their total length:

BY CONTRACT.		
12-inch tile pipe	8,131	lineal feet.
15-inch "	14,022	"
18-inch "	340	"
2 x 3 feet brick sewer	11,954	"
4′ 6″ circular	3,144	"
	37,591	
BY DAY LABOR.		
9-inch tile pipe	1,020	lineal feet.
12-inch "	11,294	"
15-inch "	4,995	"
18-inch "	505	"
1′ 8″ x 2′ 6″ brick sewer	54	"
2 x 3 feet "	1,412	"
2′ 6″ x 3′ 9″ "	1,738	"
2′ 8″ x 4′ "	2,295	"
4 x 5 feet "	352	"
4 feet circular, steel pipe	256	"
	23,921	"

In connection with the construction of these sewers, 263 man-holes and 292 gullies were built.

This, in addition to former mileage, gives a total of 216.68 miles of sewers within the City limits, of which 5.98 miles are laid on lanes.

The dimensions of sewers constructed during the year range from 9-inch tile pipe to 4 x 5 feet brick. The sewers constructed during the year by contract and by day labor are shown in the following tabulated statement, which gives the cost per yard, etc.:

Street.	From	To	Size.	Description.	Length in feet.	Manholes.	Gullies.	P. D. Connect'ns	Average depth in ft.	Soil.	Contract Price.	Total Cost.	Cost per foot, including inspection, etc	Inspectors.	Contractors.
											$	$	$ c.		
Perth av	Bloor	O. and Q. Ry.	2'0"x3'0"	Brick	3,750	13	24	251	16'3"	Quicksand	22,500	24,602	6 29	C. Dobbin	A. J. Brown.
Carlaw av	Queen	Danforth	2'0"x3'0"	"	6,579	23	46	172	13'6"	Clay & s'd.	29,138	30 775	1 66	W. Hill	J. Farley.
Liberty	Jefferson	Frazer	2'0"x3'0"	"	633	3	4	47	16'6"	Loam and gravel.	3,927	4,509	6 51	B. J. Loeman	A. J. B own.
Davenp't rd.	Yonge	Hazelton	2'0"x3'0"	"	2,133	12	14	123	16'0"	Clay	11,575	12,756	5 21	W. Ireson	C. H. Clarke & Co.
Gerrard	Don River	Broadview	18"	Pipe.	1,020	3	2	..	11'0"	"	1,885	2,052	2 01	W. Hill	J. H. McKnight.
Ratlyc	Broadview	Bowden	15"	"	1,185	5	10	70	12'6"	"	2,181	2,408	2 03	A. Johnston	J. H. McKnight.
Radcliffe av.	Queen	Eastern av	"	"	951	5	4	68	6'3"	Red clay	1,133	1,690	1 77	F. Carrette	J. H. McKnight.
Irving av	Perth	Franklin	"	"	147	3	2	15	12'6"	Quicksand	880	1,294	2 90	J. C. Lucas	J. H. McKnight.
Brock av	Bloor	Northerly	"	"	1,0 6	4	6	82	12'6"	"	2,075	2,283	2 23	W. Hill	J. H McKnight.
Royce av	Perth	Symington	"	"	293	..	..	..	11'6"	Sand and loam.	698	813	2 77	W. Rowe	C. H. Clarke & Co.
Royce av	Perth	Edwin	"	"	831	4	6	52	13'0"	"	1,569	1,804	2 16	W. Rowe	C. H. Clarke & Co.
Ruskin av	Perth	Edwin	"	"	744	1	4	48	11'6"	Quicksand	1,703	2,195	2 93	B. J. Loeman	Burns&McCorm'ck
Frazer av	King	South End	"	"	1,611	8	12	128	11'1"	Sand and gravel.	3,297	3,557	2 16	W. Hill	J. H. McKnight.
Yarmouth rd	Manning	Christie	"	"	633	3	4	46	12'2"	Clay	1,133	1,317	2 08	A. Johnston	J. J. Booth.
Hoskin av	Univers'y ck	198 ft. e. of St. George.	"	"	810	5	6	13	12'.."	Sand	1,656	1,907	2 38	W. Cullen	A. J. Brown.
Essex av	Christie	West End	"	"	677	3	2	50	11'6"	Clay	999	1,131	1 37	A. Johnston	Burns&McCorm'ck
Parde	Liberty	South End	12"	"	866	4	6	62	15'8"	Sand and gravel.	1,825	1,976	2 28	W. Hill	J. H. McKnight.
Edwin av	Ruskin	Royce	15"	"	1,026	4	6	48	11'6"	Clay loam.	1,851	2,093	2 04	W. Hill	A. J. Brown.
Gore Vale av	Garrison ck.	700 ft. s. of Bloor.	"	"	1,221	4	6	81	11'0"	Hard clay.	2,032	2,460	2 01	A. McCormack	C. H. Clarke & Co.
Sheridan av.	350 ft. n. of Bank.	Dundas	"	"	519	2	2	30	18'0"	Quicksand	1,499	1,772	3 11	R. Kerr	Burns&McCorm'ck

SEWERS BUILT BY CONTRACT, 1891—*(Continued.)*

Street.	From	To	Size.	Descript'n.	Length in feet.	Manholes.	Gullies.	P. D. Connect'ns	Average depth in ft	Soil.	Contract Price.	Total Cost.	Cost per foot, including Inspec'n, etc	Inspectors.	Contractors
											$	$	$ c.		
Dupont	Manning....	Christie	15″	Pipe.	669	3	4	46	13'0″	Clay	1,113	1,300	1 97	B. J. Loeman ..	J. J. Booth.
Elm av.....	Glen rd	Gordon	"	"	868	4	4	51	12'4″	Clay loam.	1,447	1,832	2 11	W. Hill	A. J. Brown.
Atlantic av..	King	Exhibition..	"	"	1,470	5	6	98	11'9″	Sand and gravel.	2,812	3,103	2 11	R. Kerr	Wm. Jones.
Garnett av..	Christie	West End ..	12″	"	703	3	4	46	9'2″	Clay	1,031	1,240	1 76	W. Rowe	C. H. Clarke & Co.
Franklin av.	Royce	C. P. Ry ...	"	"	741	3	4	48	11'3″	"	1,517	1,320	1 78	R. Smith	Burns&McCorm'ck
L'e off Pearl.	York	Simcoe.....	"	"	876	5	..	15	9'3″	"	599	734	81	B. J. Loeman ..	J. H. McKnight.
Edwin av ..	Royce	O. and Q.Ry.	"	"	851	4	6	48	11'1″	Clay loam.	1,291	1,447	1 69	W. Parsons	John Farley.
Devonsh'e pl	Hoskin.....	Bloor.....	"	"	1,262	5	8	38	12'6″	Sand	2,078	2,430	1 92	A. Johnston	Burns&McCorm'ck
Barton av ..	Bathurst....	Euclid av ..	"	"	974	6	10	58	12'0″	Clay	1,624	1,868	1 91	W. Hill	A. J. Brown.
Centre rd ..	Roxborough	North drive.	"	"	304	2	2	4	10'6″	"	402	458	2 85	W. Hill	A. J. Brown.
Birtle av....	Jones	Brooklin pl..	"	"	686	3	4	48	13'0″	Clay loam.	1,161	975	1 42	A. Johnston	J. J. Booth.
Lynd	College.....	Dundas	"	"	1,165	5	4	84	11'6″	Sand	2,728	2,077	1 77	W. Hill	J. H. McKnight.
Garrison c'k.	College.....	Bloor.....	5'6″	Brick	....	11	..	..	13'6″	Sand & Cl'y	29,651	.....	....	R. Kerr	W. H. Cathro.

SEWERS BUILT BY DAY LABOR, 1891.

Street.	From	To	Size.	Descript'n.	Length in feet.	Manholes.	Gullies.	P. D. Connect'ns	Average depth in feet.	Soil.	Total cost.	Cost per foot, including inspect'n, etc	Foreman.
											$	$ c.	
Armour, Blair and Lisgar.	King	Queen	2'8"x4'0"	Brick.	2,295	8	10	170	21'2"	Hard clay	17,733	7 73	A. Chamberlain & R. Patterson.
Yonge	Ann	St. Alban	2'6"x3'0"	"	1,737	6	1	..	18'8"	Clay and sand	18,173	10 41	E. Howse and G. R. Carrette.
Queen	Bay	Elizabeth	2'0"x3'0"	"	505	3	3	22	18'1"	Blue Clay	7,138	6 60	E. Howse.
Queen	Bay	Yonge	15"	Pipe.	565	3	3	18	16'10"	"			G. R. Carrette.
Queen	Beverley	Peter	"	"	335	3	.	10	13'3"	Clay	8,315	3 60	A. McCormack.
Symington	Ernest	C. P. Ry	"	"	2,781	9	19	190	12'2"	Soft blue clay and sand.	8,170	2 93	R. Smith.
North drive	Rosedale rd	Terminus	12"	"	600	2	4	19	10'9"	Clay	.	.	R. Patterson.
North drive	Yonge	Rosedale rd	"	"	910	2	3	44	16'0"	"	.....	..	R. Patterson.
Rosedale rd	Roxborough	North drive	"	"	370	5	4	37	12'11"	"	..	...	R. Patterson.
Elm	Elizabeth	Chestnut	"	"	194	4	4	50	10'0"	"	457	2 35	J. C. Lucas.
Edward	Chestnut	University	"	"	183	4	2	21	9'9"	Hard clay	861	1 78	J. C. Lucas.
Melady's lane	Sydenham	St. David	"	"	357	3		17	10'8"	Clay loam	679	1 90	A. Chamberlain.
Lane off Balmuto.	.....	.....	"	"	156	1	.	1	12'1"	Quicksand	402	2 57	Geo. A. Moses.
Muir	Sheridan av	110 ft. west	"	"	198	1	2	12	10'0"	"	284	1 44	A. McCormack.
Trinity sq	North side	.....	"	"	309	2	3	13	12'5"	Clay	703	2 27	Geo. A. Moses.
Franklin av	Irving	Royce	"	"	687	3	4	2	10'8"	Quicksand	1,344	1 95	R. Smith.
Stephanie pl	Beverley	John	"	"	25	.	..	4	11'6"	Blue clay	605	2 41	F. Carrette.
Addison av	Perth	200 ft. west	"	"	248	2	2	6	11'4"	Clay	417	1 68	R. Smith.
Powell	Dale	Maple	"	"	396	2	2	24	11'3"	"	513	1 37	R. Patterson.
Walker's lane.	50 ft. north of Duchess.	Queen	"	"	249	1	1	17	10'8"	"	110	1 64	R. Smith.

SEWERS BUILT BY DAY LABOR, 1891—*(Continued.)*

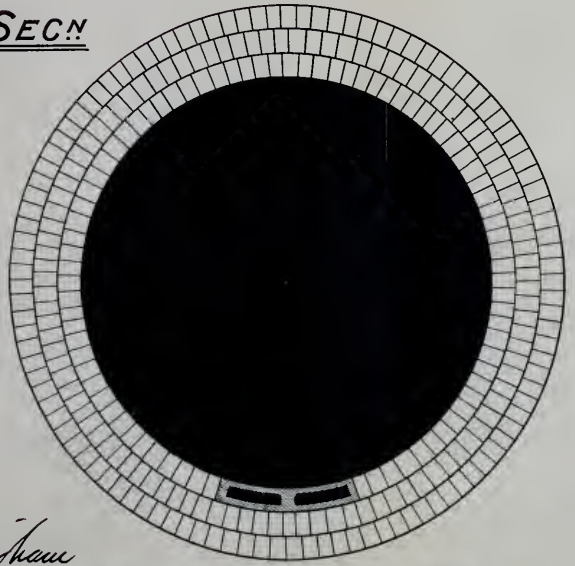
Street.	From	To	Size.	Description.	Length in feet.	Mannoles.	Gullies.	P. D. Connect'ns	Average depth in feet.	Soil.	Total cost	Cost per foot, including inspection, etc	Foreman.
											$	$ c.	
Sheridan av	Bank	350 ft. north	15″	Pipe.	351	2	3	19	10'0″	Quicksand	791	2 26	A. McCormack.
Wellesley pl	Wellesley cres	Wellesley lane	12″	"	535	3	2	5	11'3″	Sand	804	1 50	R. Patterson.
Lane off Yonge	Albert	Louisa	"	"	279	2		16	10'0″	Clay	438	1 57	W. Ireson
Front	Present term.	Don river	2'x3'	Brick.	350	..	..	..	....	.....	.....	....	W. Rowe.
Jarvis	Reconstructi'n	.....	4'x5' / 48″	" / St'l Pi'e	608	3	1	81	....	.....	4,678	7 70	G. R. Carrette.
Noble	Dufferin	West end	15″	Pipe.	700	2	3	21	13'6″	Clay	.....	....	R. Patterson.
Strickland pl	Noble	Ernbridge	12″	"	320	2	2	18	11'0″	Hard pan	412	1 28	R. Patterson.
Ernbridge	Strickland pl.	West terminus	9″	"	123	1	2	12	9'1″	"	169	1 37	R. Patterson.
Royce av	Edwin	T. G. & B. Ry.	12″	"	430	2	2	13	11'2″	Clay loam	413	96	R. Patterson.
Edmond	Royce	C. P. Ry	"	"	1,019	1	1	68	11'3″	Clay	1,214	1 15	R. Patterson.
Queen	Sumach	Don river	2'x3'	Brick.	950	5	..	42	12'2″	"	.....	....	E. Howse.
Steiner	Matilda	Don river	12″	Pipe.	800	3	4	29	8'1″	Blue clay	1,062	1 33	Geo. A. Moses.
Regent av	Regent	Blair	"	"	180	1		15	12'1″	"	397	2 20	R. Smith.
James & Albert	.....	.....	"	"	650	3	..	..	18'0″	"	1,375	2 11	A. Chamberlain.
Widmer	Richmond	South end	9″	"	235	1	..	7	11'7″	Clay	.....	....	E. Howse.
Dovercourt rd.	Blair	200 ft. north	12″	"	303	1	2	12	12'0″	"	362	1 19	R. Patterson.
Springhurst	Cowan	Jameson	"	"	1,400	4	6	38	11'0″	"	1,195	85	R. Patterson.

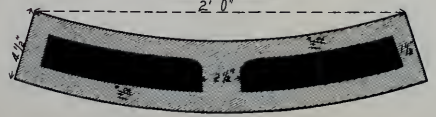
DETAILS OF

TILE INVERT used in repairing Inverts of Large Sewers.

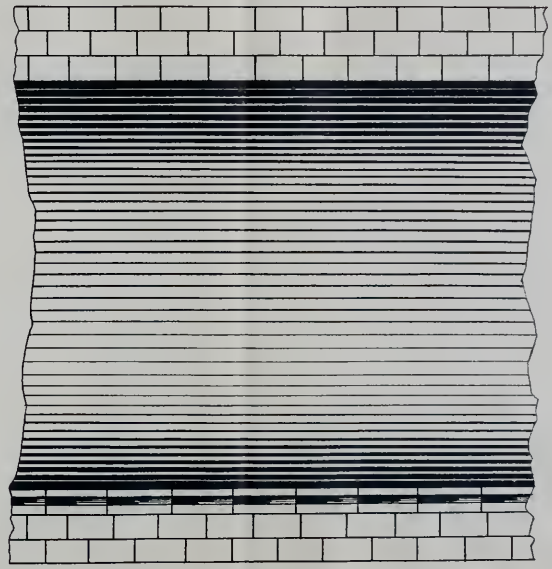
Scale 1½" to a foot.

CROSS SECN





Detail of Invert Scale 1½" to a foot.



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PRIVATE DRAINS.

During the past year 1,160 drains have been constructed, equal to 6.57 miles, made up as follows: 29,817 feet of 6-inch, 4,865 feet of 9-inch and 20 feet of 12-inch. Repairs have also been made to 78 old drains, for which a deposit of $15 each was made. After the repairs were made and cost ascertained, the balance of the deposit, if any, was refunded. If the stoppage in the drain was caused by any neglect on the part of the City, the $15 was at once refunded. The total amount received during the year for private drains constructed amounts to $25,495.47; total expenditure $22,245.57; refunded on repair account $765.85. This shows a balance of $2,484 05. The amount collected for inspection is $3,431.64; expended $5,141.75, showing a loss on inspection of $1,710.11. This deficit is caused by the inspectors having to inspect the inside work, and for which no fee is charged. The rates charged for the drains are based on the lowest tenders received for the work in December, 1890. You will see that the total amount saved during the past year through the construction of these drains by the Department, after allowing 5 per cent. for tools, wear and tear, etc., amounts to $2,484.05.

The following sewers have been constructed out of special appropriations, as being of general benefit:

GARRISON CREEK.

The section of this sewer from College Street to Bloor Street is circular, 5 feet 6 inches in diameter. This work was commenced in September, 1890, and completed in July, 1891. The contract price was $29,645.00. By the construction of this sewer an outlet has been provided for that section of the City north of Bloor Street and east and west of Dufferin and Bathurst Streets. The work was carried on very rapidly until within a short distance of Bloor Street was reached, where the work was delayed some weeks owing to the nature of the soil, which was quicksand charged with a large quantity of water.

NORTH-WEST BRANCH.

This branch of the Garrison Creek sewer, after a long delay, extending over several months, has been commenced and will be completed during the summer of 1892. The contract price is $51,496.00. Since awarding this work, the property owners on the upper section of the sewer have moderated their demands and the line has been

altered, and the cost reduced to $46,996.00. The delay was caused by the difficulty of arranging with the property owners, without, in a great many cases, having recourse to arbitration. The majority of the owners have been settled with, but there is still four or five who have not accepted the offer made by the City. Judge Morson is acting as arbitrator in the matter.

JARVIS STREET SEWER.

Jarvis Street sewer has been reconstructed at the Esplanade and the old stone sewer with an invert composed of planks and cedar logs has been torn up and a brick sewer substituted. The outlet of this sewer, which was of sheet piling, has been replaced by a 48-inch steel pipe, (see detailed drawing). The cost of the pipe, delivered on the work, was $6.99 per foot.

The following work has been done during the year by the foremen on sewer repairs:

Man-holes repaired	71
New man-holes built	204
Gullies repaired	172
New gullies built	475

Fifty-four miles of sewers have been flushed and cleaned at a cost of $73.30 per mile. During the coming year I hope to be able to do this work in a more systematic manner. During the busy season, owing to pressure of work in altering man-holes and gullies to suit the grades of permanent roadways, the foremen on sewer repairs have frequently been compelled to discontinue the work. I would recommend that in future a special gang be detailed for flushing only. A very large number of communications were received this fall complaining of the foul smell emanating from the man-holes; this was no doubt owing partly to the very dry weather experienced during that time. The greater portion of these complaints were received from residents of the upper part of the City. Rhoad-Williams Flush Tanks (12-inch) have been constructed at the following points: Perth Avenue south of Queen Street; Irving Avenue, corner of Franklin Avenue; Royce Avenue, corner of Franklin Avenue; Queen Street, corner of River Street; Darling Avenue; Lowther Avenue, 600 feet west of Avenue Road; Walker Avenue at the west end and O'Hara Avenue at the north end. These have been regulated to discharge 1,000 gallons in the 24 hours. I find that they work very satisfactorily

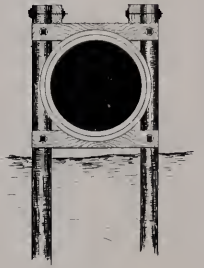
PLAN OF

EXTENSION OF SIMCOE ST SEWER SOUTHERLY

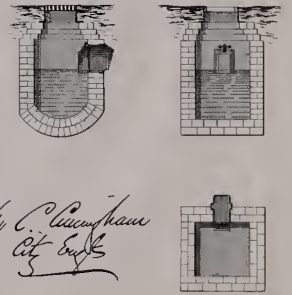
SCALE 1/4 TO A FOOT.

CITY OF TOR

LONGITUDINAL SECTION.



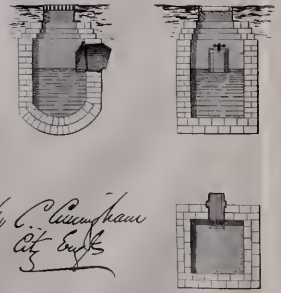
CROSS SECTION.



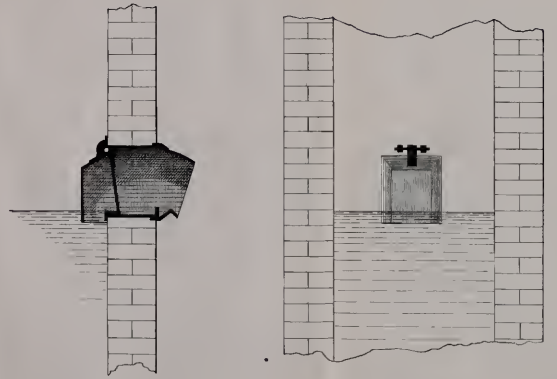
Daniel C. Cunningham
City Engr.

General View of Trap
Scale 1/4 to a foot.

CITY OF TORONTO GULLY TRAP



General View of Trap
Scale ½ to a foot.



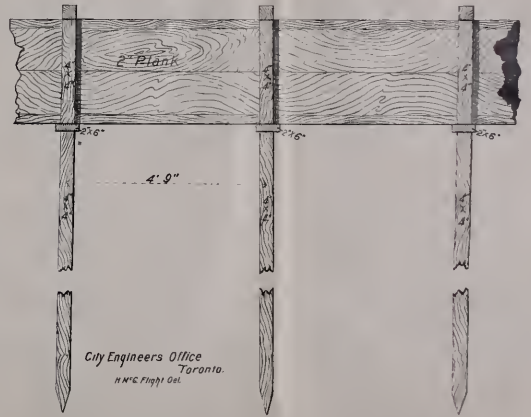
Detail of Trap
Scale ¾ to a foot.

DETAILS OF
Extension of Sewers into Ashbridges Bay

Scale ½" to a foot.

Cross Section

Side Elevation



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Toronto.
H.M.C. Flight Cel.

Alexander & Cable Co Ltd Toronto.

and keep the sewers clean and free from deposit. I purpose, during the coming summer, constructing others at several points, where required.

QUEEN STREET SEWER.

Owing to the frequent complaints of flooded cellars on this street, east of Sumach Street, on account of the insufficient capacity of the sewer at Sumach Street to take away the excessive storm water of the past two seasons, it became necessary to provide some relief, and the old 2 x 3 brick sewer on Queen Street, which drained from River Street westerly into Sumach Street, was torn up and a new sewer for storm water only, of the same capacity, was constructed, running east into the Don, and an over-flow connection made with the Sumach Street sewer at Queen Street. A 9-inch tile pipe sewer was constructed on the south side of Queen Street for drainage purposes only. By the completion of these works there should be no more complaints of flooded cellars in this locality.

LOCATION OF OLD SEWERS.

Previous to 1876 there was no established City datum, but on the appointment of Mr. Frank Shanley as City Engineer, a party was detailed for this work. Since then all our sewer plans have been plotted to this datum. All plans plotted previous to this were from no regular datum and the sewers were constructed frequently without man-holes, with the result that it has been impossible to ascertain the correct depths of these sewers. This has been a continual source of annoyance to the public, who in their building operations wished to get the depth for drainage purposes, and also to the Department in cases where new sewers had to be connected, entailing considerable cost in making openings to get this information. Mr. Pilsworth was detailed for this work and a number of man-holes have been constructed, openings made, and the depth and size of sewers ascertained and correct plans made of the work. Eighty of such plans have been made, and these include eight new plans made of sewers of which we had no record. I hope to have the work completed by the spring of 1892. In addition to this the location of all sewers, man-holes and gullies, with the depth of the sewer marked at all corners, is being plotted on Goad's Atlas, which will afford a very handy reference and will be of great service to the Department.

OVER-FLOWS.

In addition to the over-flows already constructed on Queen Street, east of the Don, six more were constructed during last year into the streets running south and emptying into Ashbridge's Bay and the Eastern Avenue sewer. This has entirely removed the frequent floodings that formerly occurred after every excessive rainstorm.

EXTENSION OF SEWERS INTO ASHBRIDGE'S BAY.

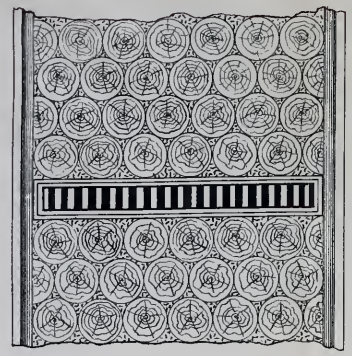
Owing to the low stage of the water in the lake this summer, the sewers emptying into this bay created a nuisance to the residents living in the vicinity. To relieve them it was decided to extend the sewers on Carlaw, Booth, Morse and Logan Avenues. The existing line of tile pipe was extended in a plank box a few inches larger than the pipe, built on piles, and the space filled in with concrete. The cost of the work amounted to $949.00; the cost per yard ranging from $4.70 to $5.20. (I attach a plan of this work.)

DAY LABOR WORKS.

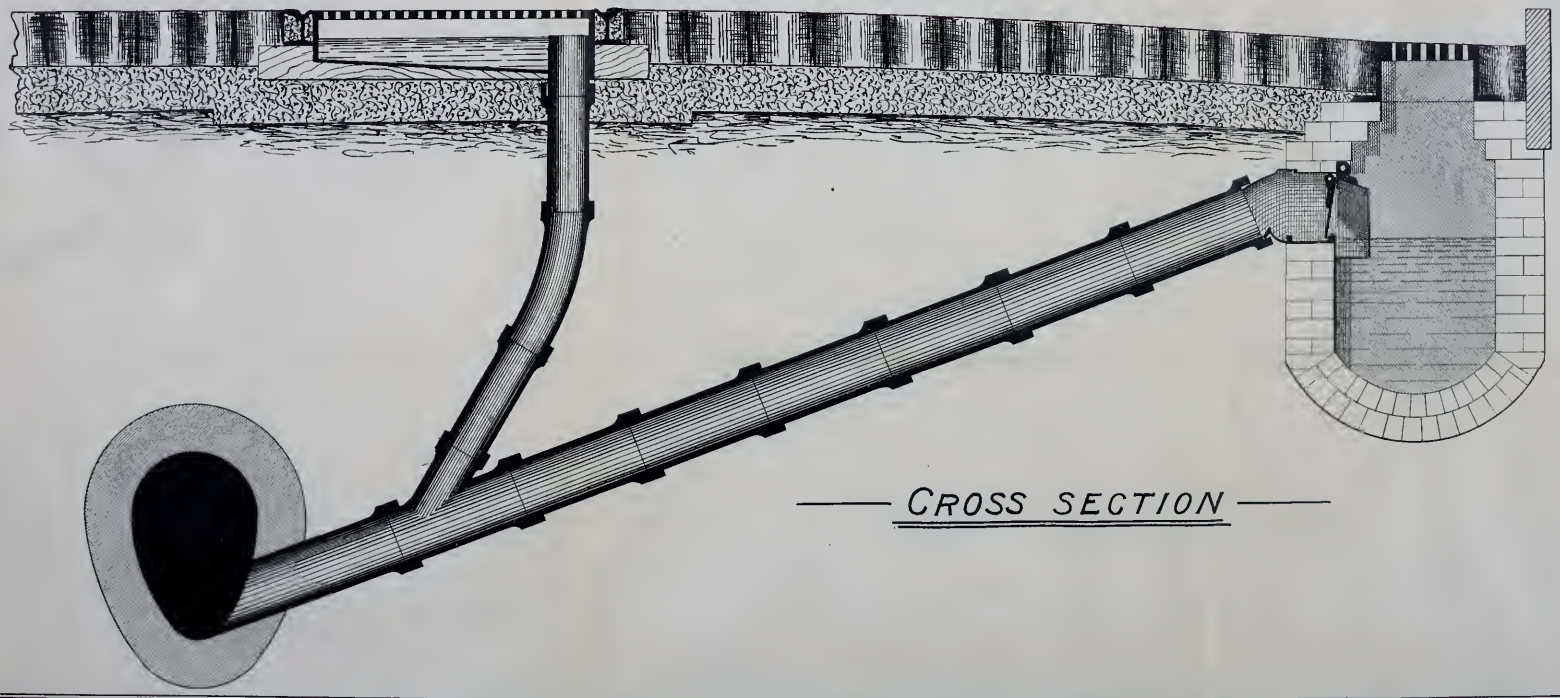
The most important sewer works carried on by day labor during the year are the Yonge Street, Armour, Blair, and Lisgar Street sewers. Owing to the insufficient capacity and bad condition of the Yonge Street sewer from Ann Street to Wellesley Street, it was decided to construct a new sewer of an increasd capacity and depth. To avoid stopping the car and vehicular traffic it was decided to build the sewer on the west side of the street keeping close to the street car track, using a "Carson's excavating machine." The work was commenced on March 9th. To expedite the work a night gang was started on April 28th, and work progressed rapidly until the 11th of June. On this date a very heavy rainstorm occurred, gorging the old sewer, which was near the new sewer, and the pressure was so great that it burst the old sewer with disastrous results. The rush of water rapidly displaced the shoring, and a very large excavation, 20 feet deep and about 60 feet in length, extending to the west side of the street and easterly as far as the east side of the street car tracks, was quickly made. The 12-inch water main settled and a large additional body of water was added; but, fortunately, we were able to turn the water off at once, thus preventing any injury to the foundations of the stores on the west side of the street. This accident delayed the work several days and added at least $1,000 to its cost,

PLAN OF
GRATING FOR STREET RY. TRACKS

Scale ½" to a foot.



PLAN



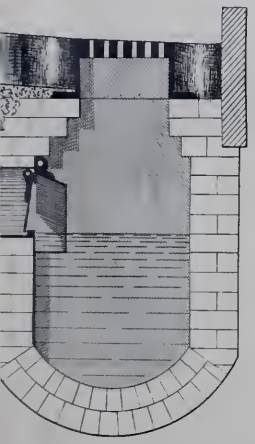
CROSS SECTION

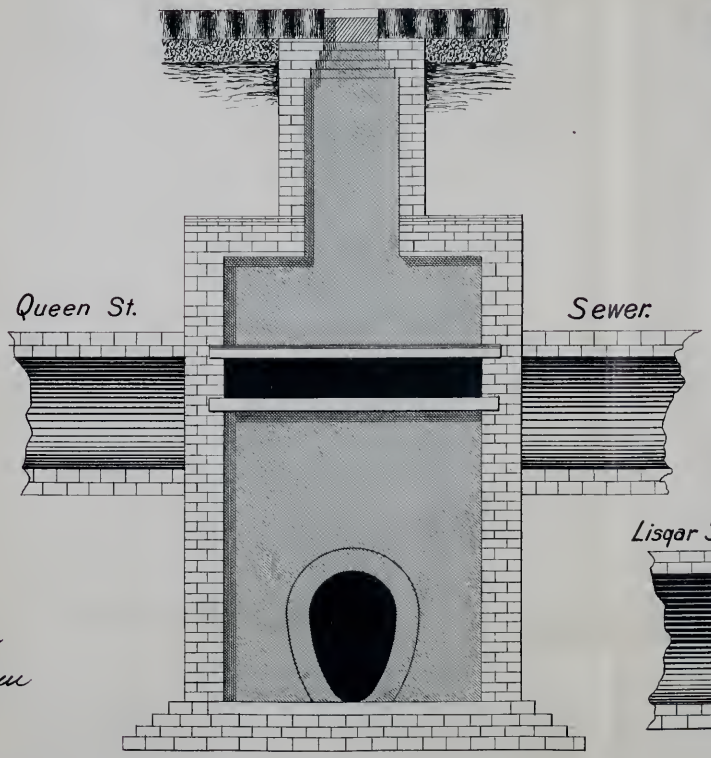
Granville C. Cunningham
City Engr.

DETAILS OF
OVERFLOW AT QUEEN AND LISGAR STS

Scale 1/4 to a foot.

RY TRACKS





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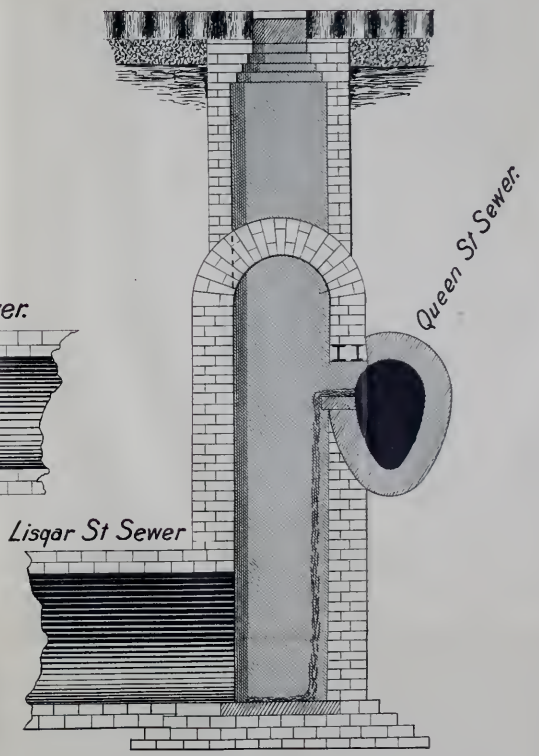

CROSS SECN

Granville C. Cunningham
City Engr

Wm McG. Flight, Del.

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which is $14,952.96. This does not include the cost of re-laying the gas main or repairing the street. The sewer is a 2′ 6″ x 3′ 9″ with an average depth of 18′ 6″.

Armour, Blair and Lisgar Street sewer was constructed as an over-flow to relieve the Queen Street West sewer, and discharges into the King Street sewer immediately east of the subway. It is 2′ 8″ x 4′. The tender was awarded to C. H. Clarke & Co., at the price of $13,160, but the contractors refused to go on with the work on the ground that they had made an error in their calculations. The Committee then decided to do the work by day labor, under the direction of the Department. The cost is $15,477.00, the office estimate being $16,946.00. By the construction of this sewer the frequent gorging of the Queen Street sewer will be prevented. It was rather remarkable that on the very day the work was completed a very heavy rainfall was experienced, 0.68 inches of water falling in fifteen minutes. The over-flow worked well, the Queen Street sewer only running one-half full and no flooding occurred, as would certainly have happened if this over-flow sewer had not been constructed.

The cost of sewer work this year has been slightly lower than last year owing partly to the lower price of material and also fewer works gowing on and consequent keener competition on the part of contractors to obtain work. The cost of excavation, including back-filling, timbering, etc., on sewers constructed by day labor by the Department has ranged fron 30 cents to 85 cents per cubic yard. Brick work per 1,000, laid complete in Portland cement, $21.00 to $24.50.

CEMENT.

During the past year a large number of tests have been made of the various brands of cements used on the different works, and also of a number of samples sent by agents and others to be tested, of which several where Canadian samples of Portland cement. The tests of these cements so far have been fairly satisfactory. The "Star" brand, manufactured at Napanee and the "Sampson" manufactured at Owen Sound, have given very good results, About 60 barrels of the latter have been used in the construction of the Garrison Creek sewer. The great difficulty so far met with in the Canadian Portland cement, seems to be in obtaining a uniformly good quality. This no doubt will be overcome as the manufacturers gain experience and use due

care in mixing the material, which should certainly in all cases be subjected to chemical analysis. It would assist the Department very much if we had the means of making chemical analysis. The apparatus necessary for this would cost about $150. I attach diagrams showing the strength of the various samples tested during the year.

PLUMBING INSPECTION, YEAR ENDING DECEMBER 31st, 1891.

Permits Issued.	Dec. 31st. 1891.	Dec. 31st. 1890.	
Plumbing and Drainage	1172	1196	
Plumbing only	268	326	
Drainage only	262	309	
Total	1702	1829	Decrease 127
Number of Buildings Represented in the Above.			
Plumbing and Drainage	2353	2504	
Plumbing only	294	392	
Drainage only	395	444	
Total	3042	3340	Decrease 298
Notices For Inspection Filed.			
Plumbing	3113	2669	Increase 444
Drainage	1236	1324	Decrease 88
Total	4349	3993	
Number of Inspections Made.			
Plumbing	5549	5338	Increase 211
Drainage	4944	5296	Decrease 352
Total	10493	10634	

Eastern Section.
East side Yonge Street to City Limits.. 1667 Inspections

Central Section.
West side Yonge Street to Shaw Street 2205 Inspections

Western Section.
Shaw Street to City Limits 1677 Inspections

Total 5549

Classification of Buildings for which Permits have been Issued.

Dwellings and Stores	1556
Warehouses and Factories	54
Municipal and Public Buildings	29
Churches	12
Schools and Convents	20
Hotels	31
Total	1702

DIAGRAM SHEWING THE STRENGTH OF VARIOUS BRANDS OF CEMENT.

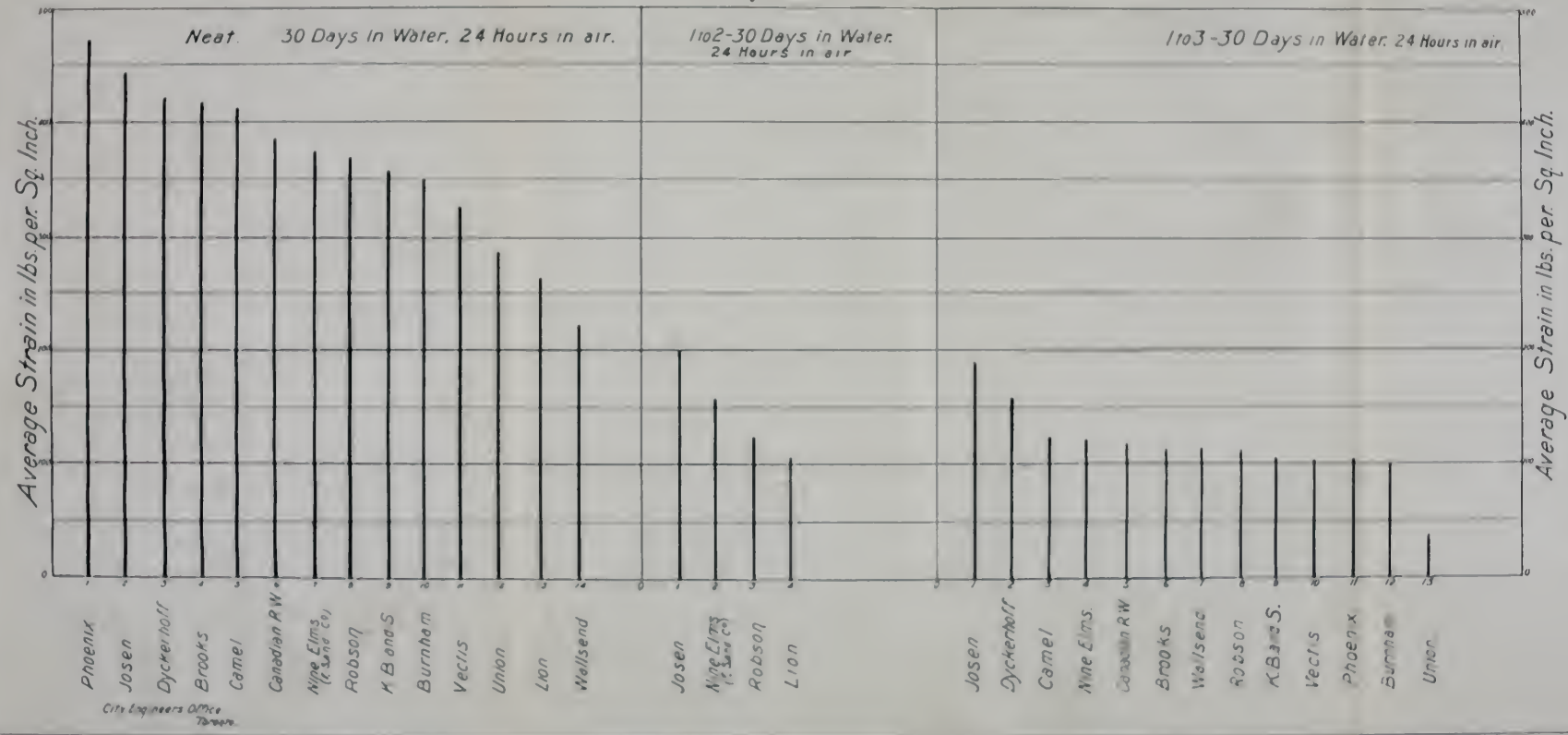

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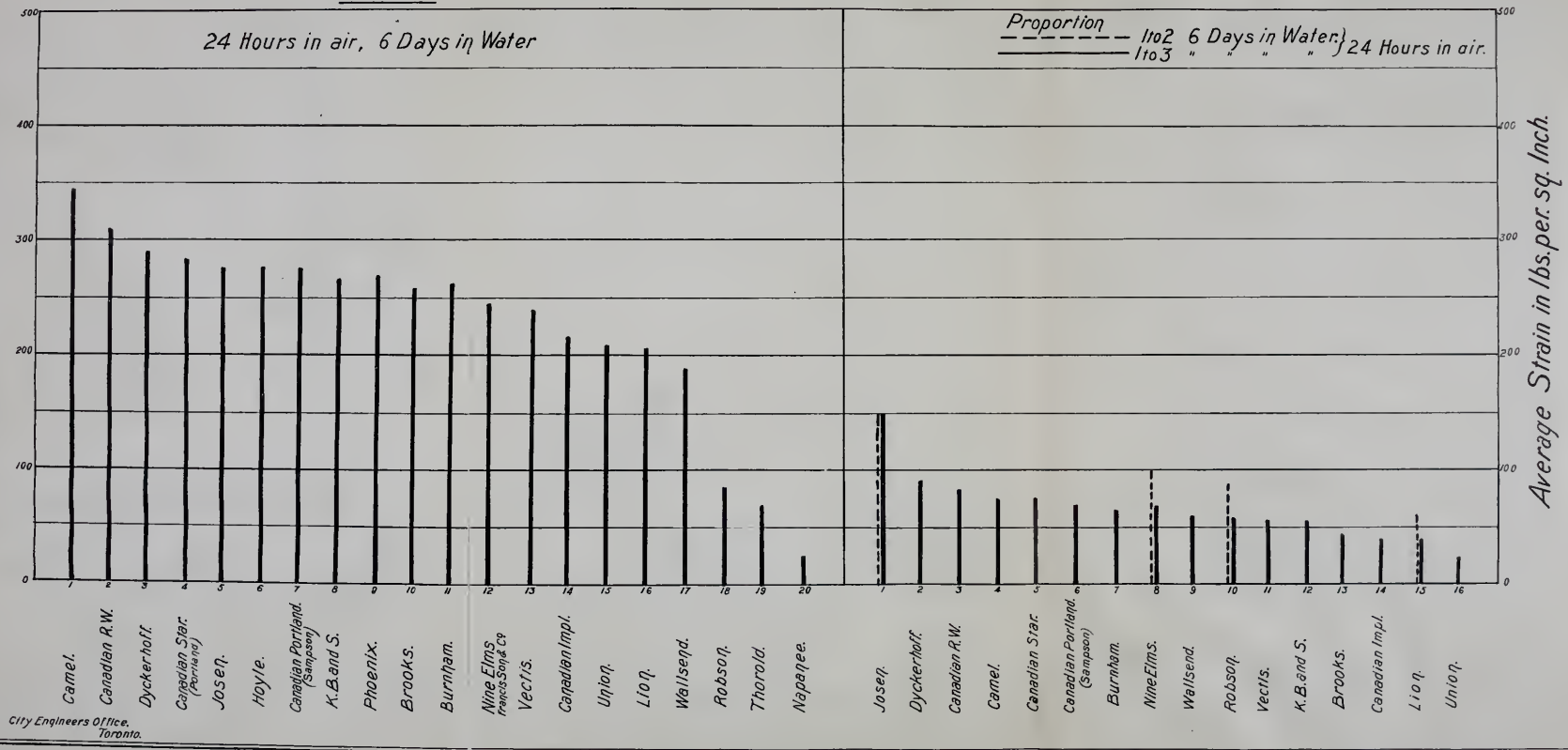
Diagram Shewing the Strength of Various Brands of Cement.

—Neat.—



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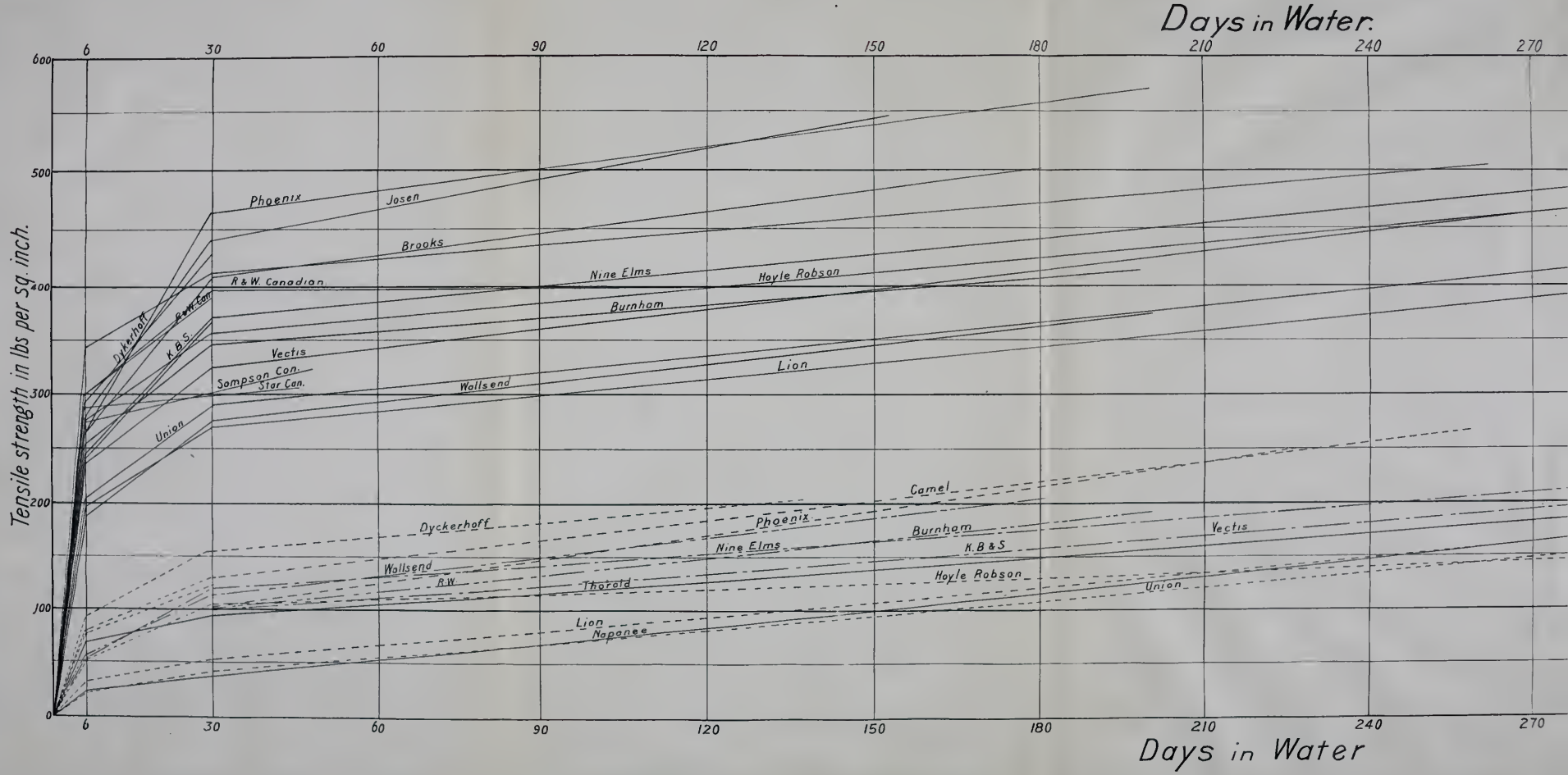
Alexander & Cable Co Ltd. Toronto.

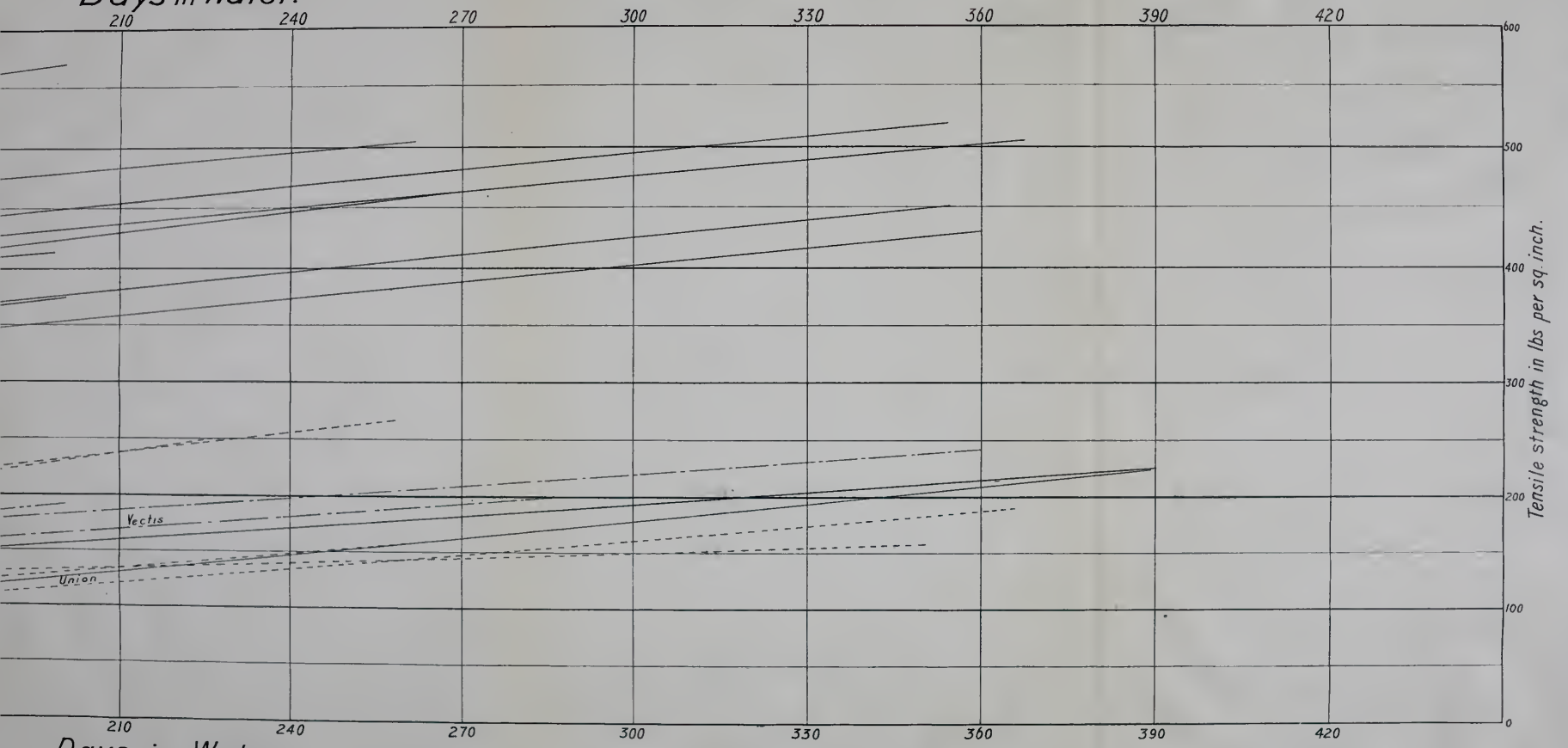
——Diagram shewing the Tensile Strength—
of different Brands of Cement from tests made during the



Alexander & Cable Lith. Co. Ltd. Toronto.

m shewing the Tensile Strength——
Cement from tests made during the year 1891.

Granville C. Cunningham
City Engr



City Engineer's Office
Toronto.

Alexander & Cable Lith. Co. Ltd. Toronto.

The foregoing tabular statement shows a decrease of 7½ per cent. in the number of permits issued for plumbing and drainage, and also of 9¾ per cent. in the number of buildings represented in same. The applications filed in the office for the inspection of plumbing work show an increase of 14¼ per cent., whilst those for drain work show a decrease of 7⅛ per cent.

The increase in the number of the plumbing inspections is mainly due to the fact that there is a growing desire on the part of owners of property to have their plumbing work properly inspected and certified to as being correct, before accepting the same from the contractors. This has been more particularly noticeable during the last six months of the year.

It is also worthy of remark that a large proportion of the alterations and additions to existing plumbing work, which in the past have been made without any inspection, have during the year 1891 been done under permit from this office, and have been subject to inspection in the regular course.

It is a source of satisfaction to report an increased willingness, amounting almost to uniformity, on the part of the plumbers and owners of property to comply fully with the provisions of the By-law, and to meet the wishes of the Inspectors in their endeavor to improve the general character of the plumbing work in the City.

Of course there has been and is still exceptions, but on the whole the year has been marked by an absence of that friction between the Department and the plumbers and owners of property which existed in former years.

This has been mainly due to the promptness with which inspections have been made. With few exceptions the Inspectors have been able to examine the work within two days of the receipt of notice, and in many instances the inspection has been made on the day next following and even quite frequently on the same day on which the notice was filed.

Yours truly,

C. H. RUST,

Engineer in Charge of Sewers.

ROADWAY ENGINEER'S REPORT.

CITY ENGINEER'S OFFICE,
Toronto, December 31st, 1892.

GRANVILLE C. CUNINGHAM, ESQ.,
City Engineer.

DEAR SIR,—In accordance with your instructions I have prepared the following report of the works performed by the Roadway branch of the Works Department during the year 1891.

The amount expended for pavements has been $384,011.22, whilst $61,642.89 was paid out for new stone or concrete sidewalks, making a total expenditure of $445,654.11.

In return for the above expenditure the following new works have been constructed:

PAVEMENTS AND GRADING.

Cedar block	9.186 miles.
Asphalt	1.635 "
Miscellaneous	.269 "
Grading	.66 "
Total	11.750 "

SIDEWALKS.

Stone flagging	.398 miles.
Cement or concrete	1.93 "
Total	2.328 "

In order to carry out the above mentioned works, 55 new contracts were let, and 19, which were carried over from 1890, were completed, making 74 in all. These were divided as follows:

Cedar block	42
Asphalt	8
Cobble stone	1
Concrete sidewalks	21
Stone flag sidewalks	2
Total	74

In addition to the above, 21 separate works were performed by day labor, which were divided as follows:

Cedar block	13
Wood on concrete	2
Miscellaneous	6
Total	21

The total number of day labor and contract works executed by this Department during the past year is 95. In order to carry out the various works already mentioned, 180 plans and 480 estimates were made.

DAY LABOR WORKS.

The pavement on King Street, from Dufferin Street to 3,000 feet easterly, which is the largest work as yet undertaken by day labor, was successfully brought to a conclusion. This work commenced in August, 1890, and was continued without intermission until the end of November, when the work was closed for the season. Operations were resumed towards the end of April, 1891, and continued until the completion of the work in July. The estimated cost of this work was $54,864. The actual cost, including extras, is $47,629.46, of which amount $34,896.23 was expended for material and $12,733.23 for labor. Including all extras the total cost is $49,867.73. The different classes of pavement of which this work is composed are granite setts, scoria blocks, round cedar and square cut tamarac. These were all laid on a 6-inch bed of concrete, with one inch of sand between the blocks and concrete as a bed or cushion.

Whilst the work was in progress accounts were kept of the time and material used so as to ascertain what the different kinds of pavement cost per square yard. The excavation averaged 18½ cents per square yard and was composed of clay, sand and gravel with boulders intermixed. Heavy rain storms during the progress of the work occasioned considerable trouble, the water running down the slopes into the subway, causing both delay to the work and additional expense for excavation, while the constant passage of vehicles through the subway during wet weather, caused the material to become semi-liquid. This half fluid mud had to be taken away in barrels, and sand or gravel put in its place before the foundation of concrete could be laid down. The concrete base is six inches in depth, and is composed of the best Portland cement mixed with gravel and broken stone in the proportion of one part of cement, to seven and one-half of broken stone and two and one-half of gravel. Its total cost is $11,749.05 or 80½ cents per square yard. Of this amount $2,511.63 was expended in labor and $9,237.42 for material. The concrete was first mixed on boards and then thrown down and rammed until a smooth surface parallel to that of the finished pavement was obtained. The following brands of cement were used in the work: Vectis,

Nine-Elms, K. B. and S., Hoyle-Robson and Bull-dog. The street car rails were laid on longitudinal stringers resting on wooden ties three feet apart, and stone setts or scoriae blocks were laid between the rails and in the devil-strip, whilst outside the rails a toothing was laid of the same material. On each side of the track, square cut tamarac or round cedar blocks were laid, and on that portion of the roadway underneath the subway, the entire width was laid with scoriae blocks, with the exception of the spaces between the pillars, where a concrete pavement was laid. The square tamarac blocks were cut from four-inch planks, seven, eight and nine inches in width. These blocks were laid in rows at right angles with the roadbed, with a lath between each row, and a grout composed of the best Portland cement and clean sharp sand was poured into the spaces. All the wooden blocks were dipped in a preservative, (known as "Finch's Wood Preservative") before delivery on the ground. The cost of preserving these blocks amounted to eight cents per square yard; the total cost being $589.25, of which amount $212.60 was expended on labor and $376.65 for material. The scoriae and granite blocks were bedded on sand in the usual manner and were then grouted with Portland cement and sand. The cost per square yard of laying the scoriae blocks is $3.66½, and the granite setts $3.33¼. These prices include the grading and concrete foundation. The tamarac pavement cost $2.45¾ per square yard, and the cedar block $1.82. These prices include the cost of grading, concrete and preservative. The cost of laying and grouting the various classes of pavement, the grading and concrete base being completed and for labor only is as follows:

Granite	24½	cents per square yard
Scoriae	23	" "
Cedar, round	13	" "
Tamarac, square	35	" "

In all the above works the minimum price paid for wages was fifteen cents per hour.

The kerbing on this work is composed of six inch stone kerbs not less than four feet in length and surrounded by six inches of gravel. The total length of straight and circular kerbing laid is 5,904 feet, and the cost of the work is as follows:—

Labor	$1,780 17
Material	4,396 84
Total	$6,176 91

Or approximately $1.04½ per lineal foot.

A comparison of the detailed cost of this work with prices received in this office from contractors for similiar work is given below :—

	Contract.	Day Labor.
Tamarac on concrete with Finch's preservative	$3 00 per sq. yd.	$2 45¾ per sq. yd.
Stone kerbing, six inch straight	1 25 per lin. ft.	1 04½ average
" " " circular	1 50 " "	cost of both.
Concrete	5 00 per cub. yd.	4 83 per cub. yd.
Stone setts on concrete	4 12½ per sq. yd.	3 33⅓ per sq. yd.

The following tables show the actual cost of this work including all extras :—

KING STREET, DUFFERIN TO 3,000 FEET EAST,—STATEMENT SHOWING TOTAL COST OF WORK

Class of Pavement.	No. of Square Yards.	Cost of Grading.	Cost of Concrete.	Cost of Material Exclusive of Concrete.	Cost of Labor.	Total Cost, Exclusive of Finch's Preservative.	Total Cost.	Cost per Square Yard.
		$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Granite	2,054	379 10	1,655 29	4,305 70	505 41	.....	6,845 50	3 33 1/3
Tamarac	3,706	684 03	2,986 62	3,859 64	1,278 98	8,125 24	9,107 10	2 45 3/4
Scoriae	4,660	860 10	3,755 44	11,376 26	1,079 61	.....	17,071 41	3 66 1/2
Cement	533	98 38	429 54	368 14	313 90	.....	1,209 96	2 27
Cedar Block	3,626	669 26	2,922 16	2,307 24	484 00	5,713 40	6,674 08	1 82
	Lineal feet.	.....	.....	.....	.....	.....	.....	Lin'l feet.
Kerbing	5,903.5	.....	.....	4,396 84	1,780 07	.....	6,176 91	1 04 1/2
	14,579	2,690 87	11,749 05	26,613 82	5,441 97	.....	47,084 96	....
Miscellaneous charges, repairs of tools, etc							544 50	
							47,629 46	
Extras:								
Sodding							657 94	
Tile Drains							104 18	
Water Pipes							469 35	
Jefferson and Exhibition Avenues, grading							818 48	
Grading and filling sidewalk							188 32	
							49,867 73	

KING STREET, DUFFERIN TO 3,000 FEET EAST,—SUMMARY OF LABOR AND MATERIAL.

Class of Work.	Labor.	Material.	Total.
Concrete	2,511 63	5,237 62	7,749 25
Broken Stone	1,100 95	2,506 13	3,607 08
Gravel	626 80	983 43	1,610 23
Kerbing	1,780 07	4,096 13	5,876 20
Granite	505 41	4,220 13	4,725 54
Tamarac	1,278 98	3,678 89	4,957 87
Scoriae	1,079 61	11,143 52	12,223 13
Cement Pavement	313 90	220 25	534 15
Cedar Block	484 00	2,133 29	2,617 29
Grading	2,690 87	.....	2,690 87
Finch's Preservative	212 60	376 65	589 25
Miscellaneous	148 41	300 19	448 60
	12,733 23	34,896 23	47,629 46
Extras:			
Sodding	657 94	.....	657 94
Tiled Drains	54 18	50 00	104 18
Water Pipes	469 35	.....	469 35
Exhibition and Jefferson Ave's	818 48	.....	818 48
Grading and Filling for Sidewalk	188 32	.....	188 32
	14,921 50	34,946 23	49,867 73

Total Labor	$14,921 50
" Material	34,946 23
Grand Total	$49,867 73

QUEEN STREET RAISING.

Another work carried out by the Roadway branch by day labor is the raising of that portion of Queen Street known as "the Brewery Hollow," opposite the Bickford property. The necessity of raising the street at this point having been decided upon, plans of the work were made in 1889, the estimated cost of which was $8,562, including the expense of new wooden sidewalks. This amount, however, did not include the cost of damages to property. The street was raised four feet at the lowest point and 650 feet of the roadway had to be raised and repaved. One of the chief difficulties to contend with in connection with this class of work is to avoid causing any obstruction to the

street traffic, and the whole of this work was carried out without stopping the travel on the street for a single hour. Some idea of the magnitude of the travel on Queen Street may be gathered from the fact that 588 pedestrians passed this spot every hour between five a.m. and ten p.m., or about ten to the minute, 26 street cars and 128 vehicles of various descriptions passed hourly, or one street car every two and a half minutes and one vehicle every half minute.

The work was commenced on the 8th of June, by placing switches in the car tracks near Niagara Street, to the east, and Strachan Avenue, to the west of the hollow, to divert the cars from the southerly to the northerly track, A gang of men then started to tear up the tracks on the southerly side, and material was brought to fill up the northerly and southerly sides of the roadway. After the old blocking was taken up, all the gravel that was lying underneath was carefully carted away and placed upon one side to be subsequently used as bedding for the new pavement and thus save the expense of purchasing new gravel. The sidewalk on the southerly side, which previously rested on posts, was torn down, and that on the northerly side was also taken up and material placed there for filling. While this work was going on, the street cars ran upon the northerly track, which still remained in place, and vehicles travelled over the earth that had been laid down in thin layers so that it might become thoroughly consolidated by the passage of vehicles. On June 11th, one of the heaviest rainstorms occurred that has happened for many years, and from the Toronto Observatory report I find that 0.68 inches of water fell in about fifteen minutes. In the expectation of wet weather, arrangements had been made to take the surface water into the street gullies, passages having been left for this purpose; but this unprecedented rainfall gathered so much rubbish along the street that the gratings were soon choked and the water commenced to rise over the street car tracks until it reached a point level with the floors of the street cars. A ditch was immediately cut through to the side of the street and the water drawn off into the old creek. On June 16th another very heavy storm occurred, but fortunately not as bad as the previous one. Whilst the filling in proceeded, a temporary track was laid on the south side and brought approximately to grade, and on the 18th the street car travel was transferred from the northerly track to this temporary one. The north track was then torn up

and the work of raising the centre of the road commenced. After the central portion of the roadbed was brought to subgrade, gravel and ashes were placed upon the top to make a dry and solid foundation for the passage of vehicles.

Filling in then continued on the northerly side of the street and upon the avenue leading to the Bickford property, until June 30th, when the work of filling ceased and only a few men were retained to keep the roadway in repair. Ashes and gravel were placed wherever a settlement showed itself, and the street was left in this condition so that it might become thoroughly settled before being paved. The settlement over the travelled portion of the roadway was very slight, in fact over most of it there was none, but on the north side of the street and on the Bickford property, where the travel was light, the subsidence was more than on any of the other portions of the road, and 245 loads of fresh material had to be brought to supplement what had been already placed there. On August 7th, the work of paving and placing the street car tracks in their proper position commenced. To do this the ashes and gravel were loosened on the surface with a plough and the ties and stringers laid for the street car tracks. The rails were then put down and the street car travel transferred from the southerly temporary track to the northerly track. The surface of the street was then ploughed, and any surplus material made use of for ballast and placed around the street car ties. The spaces between the rails and also the devil-strip were then paved with granite setts. The roadbed upon the north side was also prepared to receive the cedar blocks and paved. The south track was then torn up and the roadbed upon that side levelled and block-paved, and the work was completed. The total cost of the work, including all extras, is $8,822.76. Included in the extras is the cost of re-blocking part of Claremont Street, such alterations as were necessary to the Bickford property and keeping the roadbed in repair from the completion of the filling until the commencement of the block paving. These extras amounted to $1,614.36, leaving $7,208.40, the actual cost of the raising and filling.

KING STREET SUBWAY SIDEWALKS.

These sidewalks were laid on the northerly and southerly sides of the King Street subway and were commenced on October 24th, 1890. Although late in the year it was decided to try and complete

the work before the cold weather set in, in order to accommodate the people who live west of the subway. Work was accordingly pushed forward as rapidly as possible, but a small portion on the south side remained over and was completed last spring. This class of work is peculiarly liable to damage by frost, and although every precaution was taken by covering the stones at night, some of them were caught, and it was found necessary to re-surface them. The total number of stones thus renewed is nine on the south side and six on the north side; these were partly renewed and partly re-surfaced. The total cost of the work is $2,752.62, which is made up as follows:

Labor	$1,110 32
Material	1,511 22
	$2,621 54
Add for engineering 5 per cent	131 08
Total cost	$2,752 62

Dividing $2,621.54 by 9,352—the number of square feet of pavement laid—gives 28 cents per square foot as the price for the completed work. The average cost of this class of work by contract is, approximately, 35 cents per square foot, showing a difference of 7 cents per square foot, or 20 per cent. in favor of the day labor work. Applying the contract figures to the same quantities the following results are obtained:

9,352 at 35 cents	$3,272 20
Add 5 per cent. for engineering charges	163 61
Inspection	170 00
	$3,605 81

Deducting the total cost of the work, as laid, from this latter amount a saving of $853.19 is shown.

BAY STREET.

The pavement on Bay Street, from Front Street to Esplanade, was also laid by day labor. This work is similar to that done at the King Street subway except that the blocking is composed of round tamarac blocks instead of square, laid on a concrete foundation with 6-inch stone kerbs. The cost of the kerbing on this work averaged $1.02 per lineal foot. The concrete cost $1.07½ per square yard, the grading 16 cents, the blocking 78½ cents, and Finch's preservative 6 cents, making a total cost of $2.07½ per square yard. The propor-

tions of the concrete used in this work were 1 of cement to 7½ of stone and 2½ of gravel. The cement used on this work was similar to that used on the King Street work, being the best Portland cement obtainable.

LESLIE STREET.

This work was commenced in the fall of 1890 and completed in April, 1391. The following statement shows the actual cost of work by day labor, and also what the same would have cost if performed by contract:

Actual cost of labor including 5 for wear of tools		$630 25
Material		2,659 87
		$3,290 12
Add 5 per cent. for engineering		164 50
Add for catch water basin		7 75
Total cost		$3,462 37

Dividing by the quantity of work completed gives the following prices:

3,172 square yards cost	$2,934 47	= 92½ cents per sq. yd.
2,371 lineal feet of kerb cost	355 65	= 15 cents per lin. ft.
	$3,290 12	

The average prices tendered for this class of work, previous to the commencement of this work, were $1.10 for cedar blocking and 20 cents for kerbing. Taking the same quantities, as above, for the purpose of comparison, the amount saved by carrying this work out by day labor would be $869.83.

3,172 square yards at $1.10	$3,489 20
2,371 lineal feet kerb at 20 cents	474 20
Adjusting catch water basin	7 75
	$3,971 15
Add for inspection, 65 days at $2.50	162 50
Add for engineering 5%	198 55
Total cost on basis of contract prices	$4,332 20
Total cost of work by day labor	3,462 37
Amount saved the City and property owners	$869 83

MACPHERSON AVENUE PAVING AND GRADING BY DAY LABOR.

The cost of constructing a cedar block pavement and grading on Macpherson Avenue, from Rathnelly Avenue to Poplar Plains Road, is as follows:

Labor	$227 20
5% on labor to cover wear and tear of tools	11 36
Material	1,301 23
	$1,539 79
Add 5% for engineering charges	77 00
Total cost	$1,616 79

The amount is divided as follows:

1,220 lineal feet kerking costing	$195 20	=16c per lin. ft.
1,620 sq. yds. cedar block pavement, costing	1,344 60	=83c per sq. yd.
	$1,539 80	

The estimated cost of this pavement was	$2,016 00	
Actual cost by day labor	1,616 79	
Amount less than estimated cost		$399 21
The grading connected with this work was estimated to cost	$500 00	
Actual cost of grading work by day labor	390 52	
Amount less than estimated cost		109 48
Total amount of grading and paving less than estimated cost		$508 69

The quantity of material moved was about 2,500 cubic yards, which gives a rate of 16 cents per cubic yard.

Referring to the above cost of cedar paving and grading I have to say that at the time the recommendation to do these works was made and assented to, the tenders we were receiving from contractors were $1 per square yard for paving and 23 cents per lineal foot for kerbing. The recommendation that the works be done by day labor was made October 21st, 1890. Applying these contractors' prices to the extent of work done, and add 5 per cent. to cover engineering charges, the total cost of performing the paving work at contractors' rates would have been $1,995.60. The actual cost at day labor rates, as shown above, is $1,616.79.

So that the saving effected by doing this work on the day labor principle, as compared with contractors' prices ruling at the time the work was done, is, for paving wook alone, $378.80, or almost exactly 20 per cent.

COLLEGE STREET CEDAR BLOCK PAVEMENT, AUGUSTA AVENUE TO MARKHAM STREET.

This work consisted in widening the present roadway on the south side, and while doing this it was found necessary to make some repairs to the existing pavement, the blocking having sunk in several places and it required picking up to suit the newly laid portion. The distance which the excavated material had to be conveyed was longer than usual, most of it going to the hollow on College Street. These causes made the price of this work higher than an ordinary piece of block paving.

The following statement shows the cost of this work:

Labor	$1,061 76
Material	2,248 98
	$3,310 74
5 per cent. on labor for tools	53 00
	$3,363 74
Engineering charges	67 30
Total cost	$3,431 04

The total number of square yards of new pavement was 2,769, and in addition 392 square yards were relaid. Assuming the relaying at 55 cents per square yard, the price of this new work would then be $1.13 per square yard.

392 square yards, relaying at 55 cents	$215 60	
2,769 square yards new work	3,148 14	=$1.13 per sq. yd.
	$3,363 74	
Add for Engineering charges	67 30	
Total	$3,431 04	

The estimated cost of this work, according to the Engineer's recommendation, was $3,255.

SPADINA AVENUE WIDENING, OXFORD TO CLYDE STREET.

This work consisted in widening the westerly side of the cedar block pavement on Spadina Avenue by the addition of a strip of cedar blocking about 16 feet wide, and was done under two recommendations, one covering the distance between Clyde and Nassau, and the

other the distance between Nassau and Oxford; but it was found advantageous to carry it out as one work. The cost is as follows:

Labor	$449 28
5 per cent. to cover use of tools	22 46
Materials	757 40
	$1,229 14
The estimated cost was	$1,245 00

The total number of square yards laid is 1,177, which gives an average rate of $1.04¼ per square yard. The surplus earth from this work, had to be hauled, approximately, 5,200 feet, thus adding materially to the total cost.

SHAW STREET, QUEEN TO DEFOE STREET.

This work was carried out by day labor and the following statement shows the saving to the property owners effected by this arrangement:

The material cost	$1,544 84
The labor cost	308 95
Add 5 per cent. on labor for use of tools	15 45
	$1,869 24

The cost of the work is divided as below:

1,432 lineal feet of kerb	$257 76	=18c per lineal foot.
1,870 square yards C. B. pavement	1,611 48	=86c per square yd.
	$1,869 24	

This work was recommended for day labor in January, 1891. The nearest tenders to compare with it are those received on May 11th, which averaged 95 cents for blocking and 20 cents for kerbing; and on October 13th, 1890, when the average prices were, blocking $1.02¼ and kerbing 22 cents. Taking the mean of these two sets of tenders the total cost of the work would be as follows:

1,432 lineal feet of kerb at 21 cents	$300 72
1,870 square yards of cedar block pavement at 98½ cents	1,841 95
Cost at contract prices	$2,142 67
Add for inspection	90 00
	$2,232 67

Showing an amount $363.43, or, approximately, 20 per cent. in favor of day labor work.

WOODLAWN AVENUE GRADING BY DAY LABOR.

The total cost of the Woodlawn Avenue grading work by day labor is $888.45, and the total quantity of excavation done is, approximately, 3,900 cubic yards, or about 22¾ cents per cubic yard for material moved.

The average haul upon this work was about 750 feet. This amount includes cost of grubbing and clearing away all stumps, roots and boulders which were met with on the work. An addition of 3 per cent., say $27, should be added for engineering expenses, making the total cost, with this addition, $915. The amount of money appropriated for doing this work was $1,000.

KING STREET, STRACHAN AVENUE TO SUBWAY INCLINE.

This work was executed by day labor, the estimated cost for the work being $2,300. When the estimate was made it was intended only to widen the existing pavement 12 feet, subsequently it was decided to carry the street car tracks from Strachan Avenue to join those through the Subway, and to lay granite setts between the car tracks. When the work was commenced, the old blocking was found to be so badly damaged by the excavation made when renewing the old sewer, that the Engineer decided to relay the whole work, which was ultimately done.

When the old blocks were removed they were found to be in a very bad condition, and very few were fit to be relaid.

The cost of the work is as follows:

Labor		$2,789 51
5 per cent. on labor for use of tools, etc		140 85
Material		6,655 91
	$9,586 27	
Add for Engineering charges 1 per cent	95 86	
Total cost		$9,682 13

The approximate cost of the different classes of work is as follows:

Stone setts, 2,100 square yards	$5,775 00	=$2.75 per sq. yd.
Wooden kerbing, 2,500 lineal feet	375 00	=15cts. per lin. ft.
Cedar block pavement, 3,733 square yards	3,436 27	=92cts. per sq. yd.
	$9,586,27	
Add for Engineering charges 1 per cent	95 86	
Total cost	$9,682 13	

GRAFTON AVENUE.

This work, which was performed by day labor, was recommended by the Engineer at a cost of $1,680, this amount being for a distance of 480 feet easterly from Roncesvalles Avenue. It was afterwards decided to continue the pavement to Triller Avenue, a total distance of 578 feet, and for this length tenders were advertised for and received, the lowest being $1,989.00. The excavation upon this work was heavier than usual, averaging upwards of three feet at the easterly end.

The Engineer subsequently recommended the construction of the pavement by day labor, and work was commenced in April, and completed in May, at a total cost of $1,834.96, which is made up as follows:

Labor, including 5 per cent. on tools	$369 76	
Materials	1,377 82	
	$1,747 58	
Add for Engineering charges 5 per cent	87 38	
Total cost		$1,834 96

Comparing this with the prices tendered, viz., $1,989.00, and adding 5 per cent. for engineering charges, and $70.00 for necessary inspection of contract work, it will be seen that a saving of $313.49 has been made to the property owners, or approximately 17 per cent.

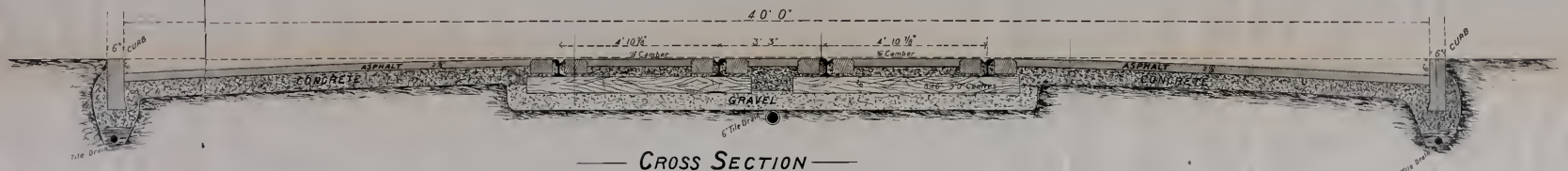
In almost all the day labor works completed this year, a comparison of their cost with the prices tendered show a saving of from 15 to 20 per cent. as compared with contractors' prices. That work can be done by the City more cheaply than it can be done by contractors has been amply demonstrated by the work undertaken and completed during the past two years. But it throws a great deal of responsibility and annoyance, without mentioning the additional work entailed, upon this branch of the Department.

NORTH SHERBOURNE STREET.

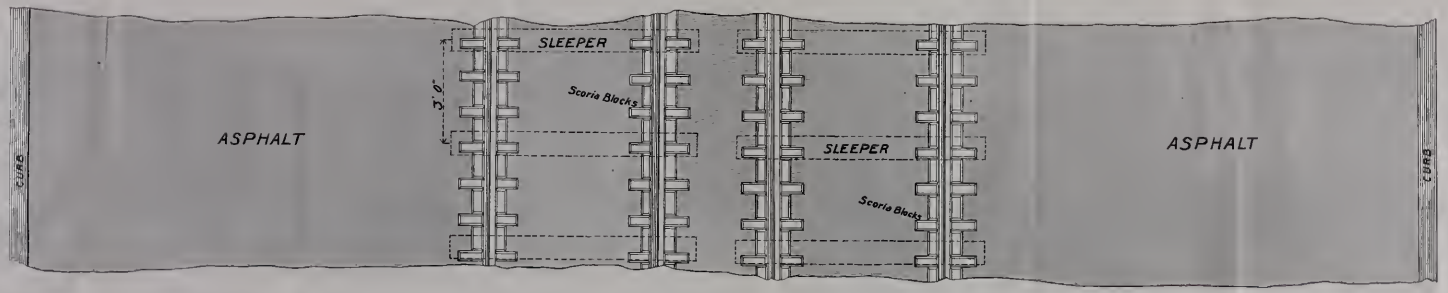
On North Sherbourne Street, from the Bridge to South Drive, an asphalt pavement with 6-inch stone kerb was constructed. This is the first street upon which the new street car rail has been laid. This rail is spiked directly to the ties without any longitudinal sleeper, the joints being fastened together with angle bars, while for electrical purposes copper wires join the ends of each rail. The ties,

PLAN OF
SHERBOURNE ST. (NORTH) PAVEMENT

Scale 1½" to a foot



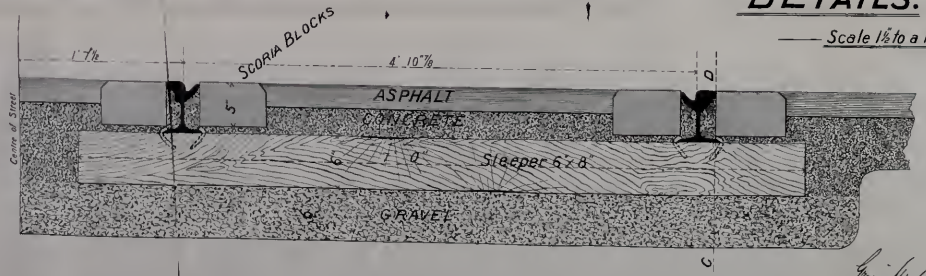
CROSS SECTION



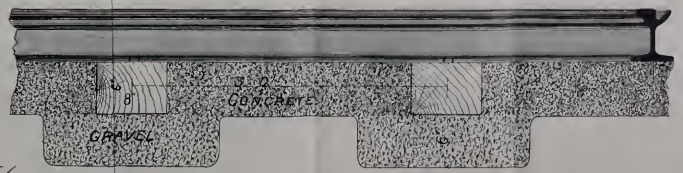
PLAN

DETAILS.

Scale 1½" to a foot



CROSS SECTION



LONG: SECTION C.D

Granville C. Cunningham
City Engr

Alexander & Cable Co. Ltd. Toronto.

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which are laid on 6 inches of gravel, are bedded in the concrete, which is thoroughly rammed around them. Scoria blocks are laid as headers and stretchers both inside and outside the rails; and after the asphalt was put down, tar was run into the joints, making the whole surface practically waterproof.

TORONTO STREET.

This street, which was originally laid with blocks composed of some composition of tar or asphalt and gravel, having become worn out, it was decided to lay a coating of sheet asphalt upon the top of the old blocks. Those parts of the roadway which were in the worst repair were cut out and filled with a mixture of Portland cement and gravel until an even surface was obtained, and upon this a coating of sheet asphalt was laid. This work was done very late in the season and the weather being cold it became necessary to heat the asphalt to a higher degree than was prudent, in order that it might arrive on the work at the proper temperature, in consequence a portion of the mixture was burnt and will have to be relaid by the Contractors in the spring.

ST. GEORGE STREET.

This roadway, from College Street to Bloor Street, which was formerly laid with cedar blocks, has had its entire roadbed laid with sheet asphalt in place of the old pavement, which was in bad repair.

JORDAN, MELINDA AND WELLINGTON STREETS.

These streets, which, although in the heart of the City, were formerly almost impassable for heavy traffic, being little better than mud roads, were paved with asphalt this season, and now take a large portion of the heavy traffic, thus considerably relieving King Street.

BENCH MARKS.

A series of levels was commenced last year with the object of establishing permanent bench marks throughout the City, and using as a datum the zero level of Lake Ontario as indicated at the Queen's Wharf. This work was carried on during the winter and at times when the staff was not engaged on the regular office work. Duplicate readings were taken with separate instruments and by different observers, the readings compared, and places for the bench mark plates located. Check levels were then taken, and the final elevation established.

Brass plates were then put in position having the elevation marked upon them and a projecting lip indicating the exact point to which the elevation is given. About 51 plates have already been placed in various parts of the City.

These levels when completed will be a great saving in time to the staff, especially when called upon to give building levels, the demand for which is daily increasing, and people are beginning to recognize the necessity of having the proper street grades given to them before putting up expensive buildings. During the building season the demand for building levels is so constant that a large portion of the time of the staff of this Branch is taken up in supplying them to builders and architects.

Whilst carrying on this work a bench mark was found at the Toronto Observatory, which was put in by Prof. Cherriman, and a staff from the Royal Engineers. The elevation of this bench mark was 104 feet 6 inches above the water level of Lake Ontario, on October 7th, 1854. Upon comparing this with the present series of levels, a difference of 1 foot 3 inches was found, showing that upon October 7th, 1854, the water was that much above the zero level at the Queen's wharf, which forms the datum for the present levels

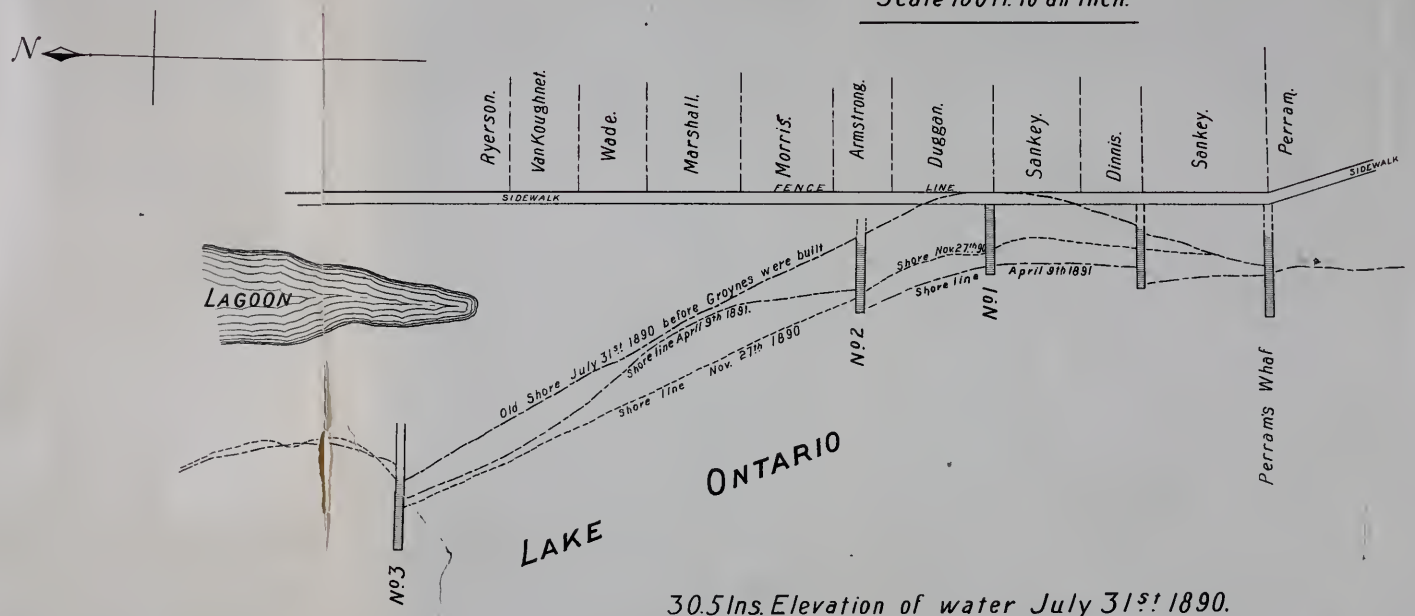
Enquiry was then made at the Harbor Master's office to ascertain the lake elevation upon October 7th, 1854, but unfortunately the daily records were destroyed some years ago by fire. A table showing the average weekly fluctuations of the water was preserved, which shows that for the week ending October 1st, 1854, the average elevation of the water was 20 inches above zero; for the week ending October 8th, the water was 17 inches above zero, while on October 15th, it was only 14 inches above zero. Applying the average elevations for week ending October 8th as a correction to the levels taken by the Royal Engineers in 1854, it leaves a difference of 2 inches between the two sets of levels, which would in all probability agree exactly if the true elevation of the lake level could be obtained for the 7th of October, 1854.

ISLAND GROYNES.

During the year 1890 groynes were built on the westerly shore of the Island to prevent any further encroachments of the lake. In July of that year a survey was made to ascertain the extent of beach that had been made by the construction of these works, and on April 9th,

Sketch showing changes in the Shore line on West side of Toronto Island Between July 31st 1890 & April 9th 1891.

Scale 100 ft. to an Inch.



30.5 Ins. Elevation of water July 31st 1890.

18.5 " " " " Nov. 27th 1890.

26.0 " " " " April 9th 1891.

Granville C. Cunningham
City Engr

Alexander & Cable Co Ltd. Toronto.

1891, when the height of the water was approximately the same, another survey was made. A sketch is attached showing the extent of land reclaimed by the construction of these groynes. I think it would be advisable to place similar structures to the north of these and also to extend the present groynes a little further into the lake, while the water is low. The total cost of laying these groynes is $485 and the extent of land reclaimed up to the date of the last survey is 53-100 of an acre, or at the rate of $900 per acre.

Surveys were made by this branch of the Department in connection with the new breakwater built by the Harbor Commissioners at the Western Gap. Numerous soundings were taken in order to ascertain any changes which might have occurred by the deposit of sand or other material since this breakwater has been placed there. Plans were made of this work and it is proposed to make surveys from time to time to ascertain to what extent the spit of land increases.

Following is a list of the pavements, sidewalks, etc., carried out by this branch of the Department during the year, by contract and day labor.

Yours faithfully,

H. D. ELLIS,

Assistant Engineer.

PATENT CONCRETE SIDEWALKS COMPLETED BY CONTRACT, 1891.

Street.	From	To	Side.	Width.	Length.	Completed.	Contractor.
				feet.	feet.		
Gerrard	Jarvis	Sherbourne	Both	6	1,838	Sept. 22	R. Forsyth.

PATENT CONCRETE SIDEWALKS COMPLETED BY DAY LABOR, 1891.

*King	At Subway		Both	8	1,247	May 12.	

STONE FLAG SIDEWALKS COMPLETED BY CONTRACT, 1891.

*Yonge	Queen	College	West	12	2,993	May 28	McKeown & Challis.
Grenville	Yonge	Surrey Place	North	6	1,177	July 29	F. McKeown & Co.
*Adelaide	Op. C'rt House.		South	12	182.1	June 5	McKeown & Challis.

GRANOLITHIC SIDEWALKS COMPLETED BY CONTRACT, 1891.

Spadina	Oxford	Nassau	West	6	311.7	May 4	R. Forsyth.
*Spadina	Queen	Grange	East	16	1,061	July 2	"
*Queen	No. 280	Spadina	North	24	38.8	Apr. 25	"
Wellington	In front of Hunter & Rose's		South	11.2	45.8	May 20	"
Queen	Opp. Smith's property		South	12	168.6	July 21	"

EUREKA SIDEWALKS COMPLETED BY CONTRACT, 1891

Street.	From	To	Side.	Width.	Length.	Completed.	Contractor.
				feet.	feet.		
Queen	Spadina	Esther	South	12	830	Aug. 1	A. Gardner & Co.
*Queen	Esther	Bathurst	South	12	1,119.6	July 2	"
Queen	Gladstone Av.	85 feet East	North	12	209.4	July 16	"
Gladstone Ave.	Queen	100 feet North.	East				
Queen	Palmerston Av.	171 feet West.	North	12	178.2	May 20	"
Melinda	Yonge	Bay	Both.	8	1,041.3	Oct. 6	"
Queen	Seaton	Ontario	North	12	229.3	Aug. 11	"
Queen	Denison Av.	Bathurst	North	12	821	Sept. 3	"
Yonge	Carlton	Wood	East	12	269.6	Oct. 27	"
Queen	Berkeley	Parliament	North	12	320.10	Oct. 10	"
King	York	78 feet West.	South	12	79.10	Sept. 7	"

EXCELSIOR SIDEWALKS COMPLETED BY CONTRACT, 1891.

*College	Spadina	Robert	North.	16	404.6	May 8	Excelsior Pav'g Co.
Dundas	Bruce	144 feet South.	East	11	143.6	June 9	"
College	Augusta Av	Markham	South	16	1,470.4	Oct. 31	"

MACADAM ROADWAY COMPLETED BY DAY LABOR, 1891.

Street.	From	To	Kerb.	Width.	Length.	Completed.
			feet.	feet.	feet.	
Bismarck Av.	Yonge	Gwynne.	1,300	24	650	Oct. 17

CEDAR BLOCK ROADWAYS WITH STONE SETTS OR COBBLE, BY CONTRACT, 1891.

Street.	From	To	Paving.	Kerbing.	Width.	Length.	Completion.	Contractor.
			Sq. yards.	Lineal feet.	feet.	feet.		
*Dovere't Rd.	Bloor	Union	14,357	6,332	40	3,178	Aug. 27	D. L. Van Vlack.
Dufferin	Bloor	Union	15,587	6,452	42	3,268	Oct 6	"
Bloor	Clinton	Shaw	8,006	3,330	42	1,678	Aug. 31	A. W. Godson.

GRADING COMPLETED DURING 1891 BY DAY LABOR.

Street.	From	To	Width.	Length.	Completion.
			feet.	feet.	
Woodlawn	Yonge	West End	66	1,332	July 11
Hoskin Av	St. George	Queen's Park Drive	66	1,145	Oct. 22
Macpherson Av	Rathnally	P. P. Road	50	606	May 7
Gladstone Av	Present North Terminus	Hamilton	66	1,568	Dec. 14
Exhibition Av	King	400 feet southerly	36	400	July 21
Jefferson Av	King	"	36	400	July 29

CEDAR BLOCK ROADWAYS COMPLETED BY DAY LABOR, 1891.

Street.	From	To	Paving.	Kerbing.	Width.	Length.	Completion.
			Square yards.	Lineal feet.	feet.	feet.	
Spadina, west side	Nassau	Clyde	448	.....	15	252	May 26
Macpherson Av	Rathnally	P. P. Road	1,620	1,220	24	606	Sept. 30

CEDAR BLOCK ROADWAYS COMPLETED BY DAY LABOR, 1891. *Continued.*

Street.	From	To	Paving.	Kerbing.	Width.	Length.	Completion.
			Square yards.	Lineal feet.	feet.	feet.	
Queen St. raising at	Garrison Creek	Hollow	2,800	1,333	.....	729	Sept. 7
Shaw	Queen	Defoe	1,868	1,404	24	699	June 27
Grafton Av	Roncesvalles	East end	1,547	1,162	24	578	May 22
Dundas, east side	Bruce	144 feet south	34	.....	2	146	June 13
*College, north side	Spadina	Robert	207	.....	12.4	440	June 2
Spadina, west side	Oxford	Nassau	541	.....	14.7	311.7	May 26
*King St. widening	Strachan Av	Subway	5,833	2,480	Irregular.	1,276	Oct. 16
College	Augusta	Markham	2,769	.....	"	1,470	Nov. 4
*Leslie	Queen	Ashbridge's Bay	3,172	2,355	24	1,145	April 29
Dundas	"	Bend	40	(Finishing up work left by contractor)			May 30

TAMARAC ROADWAYS COMPLETED BY DAY LABOR, 1891.

Street.	From	To	Paving.	Kerbing.	Width.	Length.	Completion.
			Square yards.	Lineal feet.	feet.	feet.	
King	Dufferin	3,000 feet east	14,579	5,903.5	42 / 50	2,900	July 3
Bay	Esplanade	Front	2,016	864	42	409	July 18

ASPHALT PAVEMENTS COMPLETED DURING 1891.

Street.	From	To	Pavement.	Kerbing.	Width.	Length.	Completed.	Contractor.
			Square yards.	Lineal feet.	feet.	feet.		
Wellington..	Bay	York	3,957	1,738	42	848	July 18	Warren-Scharfe Co.
Gerrard.....	Jarvis.....	Sherbourne..	3,548	1,998	32	934	July 24	Constr'ng & Pav'g Co.
Melinda.....	Yonge	Bay	2,595	1,186	39	587	Aug. 5	Warren-Scharfe Co.
Jordan.....	Wellington ..	King	1,042	228	25.9 24 23	379	Aug. 5	"
Sherbourne N	Bridge.....	S. Drive	4,967	2,253	40	1,076	Nov. 11	Constr'ng & Pav'g Co.
Bay	King..	Queen	5,783	2,515	42	1,175	Aug. 15	"
Toronto.....	N.lim. of pav't	Adelaide	1,716	.....	43.6	348.9	.....	"
St. George...	College.....	Bloor.....	11,427	7,132	30	3,286	Sept. 25	"

COBBLE STONE PAVEMENT COMPLETED DURING 1891.

Rossin House Lane	York	East'ly term.	512	738	10.7 16.4	368	Sept. 24	A. J. Brown.

CEDAR BLOCK ROADWAYS COMPLETED BY CONTRACT DURING 1891.

Street.	From	To	Pavement.	Kerbing.	Width.	Length.	Completed.	Contractor.
			Square yards.	Lineal feet.	feet.	feet.		
Grace	Arthur	College	4,359	3,212	24	1,560	Nov. 26	W. H. Cathro.
*Givens	College	Bloor	9,370	5,622	30	2,811	Aug. 17	"
*McKenzie Av.	Bloor	C. P. Railway	9,912	7,168	24	3,515	June 11	D. L. VanVlack.
*Roxborough	Yonge	2,100 feet	5,923	4,376	24	2,182	May 28	John McBean.
Spadina Rd.	Bernard	C. P. Railway	3,492	2,518	24	1,247	July 2	A. J. Brown.
Phœbe	Spadina	Soho	3,359	2,130	27	798	June 1	"
Hamburg	Bloor	Union	14,343	6,368	40	3,192	Aug. 27	W. H. Cathro.
Broadview	Queen	Eastern	2,858	1,916	27	945	July 21	W. F. Donaldson.
Booth	Queen	Eastern	2,627	1,968	24	946	July 6	"
Wascana	Sumach	East End	432	420	18	207	June 22	"
Napier	Munro	Lane	753	680	20	337	June 26	"
Massey	King	Queen	3,333	2,440	24	1,208	July 15	R. Grant & Co.
Gordon	Dufferin	Sheridan	1,253	940	24	470	July 22	"
Douro	Bathurst	East terminus.	746	648	20	319	June 24	A. W. Godson.
Shirley	Brock	Lansdowne	2,509	1,828	24	903	Aug. 6	Burns & McCormack.
Lane	Ulster	Harbord	1,226	1,224	18	611	July 8	"
Harris	Queen	Paul	1,514	1,124	24	557	July 25	W. F. Donaldson.
Howard	Dundas	Roncesvalles	2,374	1,650	24	787	Aug. 27	"
Vermont	Bathurst	Manning	3,226	2,430	24	1,189	Aug. 13	"
Woodlawn	Yonge	West End	3,552	2,664	24	1,332	Sept. 19	"
Bismarck	Gwynne	East End	1,164	998	21	499	Sept. 21	A. W. Godson.
East Avenue	First Av	South Av	2,073	1,550	24	762	Sept. 5	Callaghan & Gibson.
Walmer Rd.	Castle Av	Bernard	2,710	1,772	24	716	Oct. 17	D. L. VanVlack.
Rosedale Rd.	Roxboro	North Drive	725	544	24	272	Sept. 24	W. H. Cathro.
Cawthra Sq.	Jarvis	West End	920	766	16 / 23 / 50	284	Oct. 15	"
Kensingt'n Cres	Park Rd	Huntley	1,021	766	24	383	Sept. 7	A. J. Brown.
Christie	Bloor	Melville	7,324	5,328	24	2,674	Oct. 5	Robert Grant.

CEDAR BLOCK ROADWAYS COMPLETED BY CONTRACT, 1891. *Continued.*

Street.	From	To	Pavement.	Kerbing.	Width.	Length.	Completed.	Contractor.
			Square yards.	Lineal feet.	feet.	feet.		
Delaware Av...	Bloor	Van Horne....	9,415	6,370	26	3,160	Dec. 5	Burns & McCormack.
Sully	Term'us of Pav't	College.....	1,000	720	24	350	Nov. 14	A. W. Godson.
Tranby Av	Bedford Rd ...	157½ feet east .	443	332	24	166	Nov. 3	W. F. Donaldson.
Darling Av....	N. end of Street	S. end of Sewer	578	866	12	433	Nov. 6	W. H. Cathro.
Abbs	Brock.....	West Terminus	606	596	18	298	Nov. 26	W. F. Donaldson.
Walter.....	Davenport.....	McMurrich....	1,098	837	24	391	Nov. 7	"
Brown.....	Brock.....	West Terminus	698	598	21	298	Nov. 26	"
Marion.. .. .	Lansdowne....	Macdonnell....	736	552	24	275	Nov. 21	W. H. Cathro.
Duncan	Macdonnell....	Sorauren.....	2,040	1,530	24	765	Dec. 12	W. F. Donaldson.
Henderson	Clinton	Grace	1,048	786	24	393	Nov. 14	"
Clinton	473ft. S. of Bloor	891ft. S. fr. Bloor	1,115	836	24	418	Dec. 8	W. H. Cathro.
*Frizzell Av...	Carlaw	Pape	1,593	1,198	24	596	April 21	Callaghan & Gibson.

* Roadways and Sidewalks marked thus partly done in 1890.

BRIDGE ENGINEER'S REPORT.

CITY ENGINEER'S OFFICE,
Toronto, December 31st, 1891.

GRANVILLE C. CUNNINGHAM, ESQ.,
City Engineer:

DEAR SIR,—I give below a report of the bridge work, etc., done during the year.

WINCHESTER STREET BRIDGE.—In the early part of 1891 the centre crib of the Winchester Street Bridge was carried away by the ice brought down by spring freshets, letting the centre of the bridge down nearly to the water. From the same cause the east crib had been undermined and partially sunk, the corbels in some cases were broken and the floor of bridge very badly damaged. The bridge was raised, a new centre crib built and partially filled with stone, the east crib was packed up with heavy timbers, and the deck brought up nearly to its original position. The deck was thoroughly repaired and made fit for traffic.

DON RIVER PILING.—From the same cause a large portion of the piling on the river bank, east of the bridge, gave way, letting down the road: the old piling and timbers were cleared away and new piles substituted; these were substantially tied back with iron rods to back logs and all the old timber used to cover the inside of the piling, which was further protected by placing a large quantity of brush behind them, upon which the earth filling was rammed and the roadway made good. On the outside or river side of the piling, 3-inch planks were securely spiked, to protect the face from the action of ice; this planking was carried round the last crib of the bridge. On the top of this breastwork a substantial handrailing was fixed for the protection of foot passengers.

GERRARD STREET BRIDGE.—When the Gerrard Street Bridge was built it was anticipated that the tracks of the Street Railway would be laid down in 3 or 4 months' time, therefore only the 3-inch planking was laid, the 2-inch or wearing course to be laid after the tracks were on. Nearly 3 years have now elapsed since this bridge was finished, and the 3-inch deck has had very considerable wear; repairs to the deck have been done, and in order to more efficiently

drain it, 32 holes 6 x 2 inches have been cut in the deck, near the kerb. The handrail also needed some repairs at the south-west end, which were done.

EASTERN AVENUE BRIDGE.—As is necessary with all wooden bridges this bridge has been thoroughly tightened up, the deck has been repaired and the whole bridge thoroughly painted.

ARTHUR AND SHAW STREET BRIDGES.—The Arthur, Crawford and Shaw Street Bridges (wood) have been made good for the winter, the decks, handrails and bents have been repaired where required. These bridges will require to be thoroughly overhauled during next summer.

GLEN ROAD BRIDGE.—This bridge has been thoroughly scraped and repainted (two coats). In going over the trestles for painting, it was found to be very slack in some places, some of the diagonal rods were taken out and slightly shortened. All the rods are now tightly screwed up, each doing its proper share of the work. This bridge is now in thoroughly good repair.

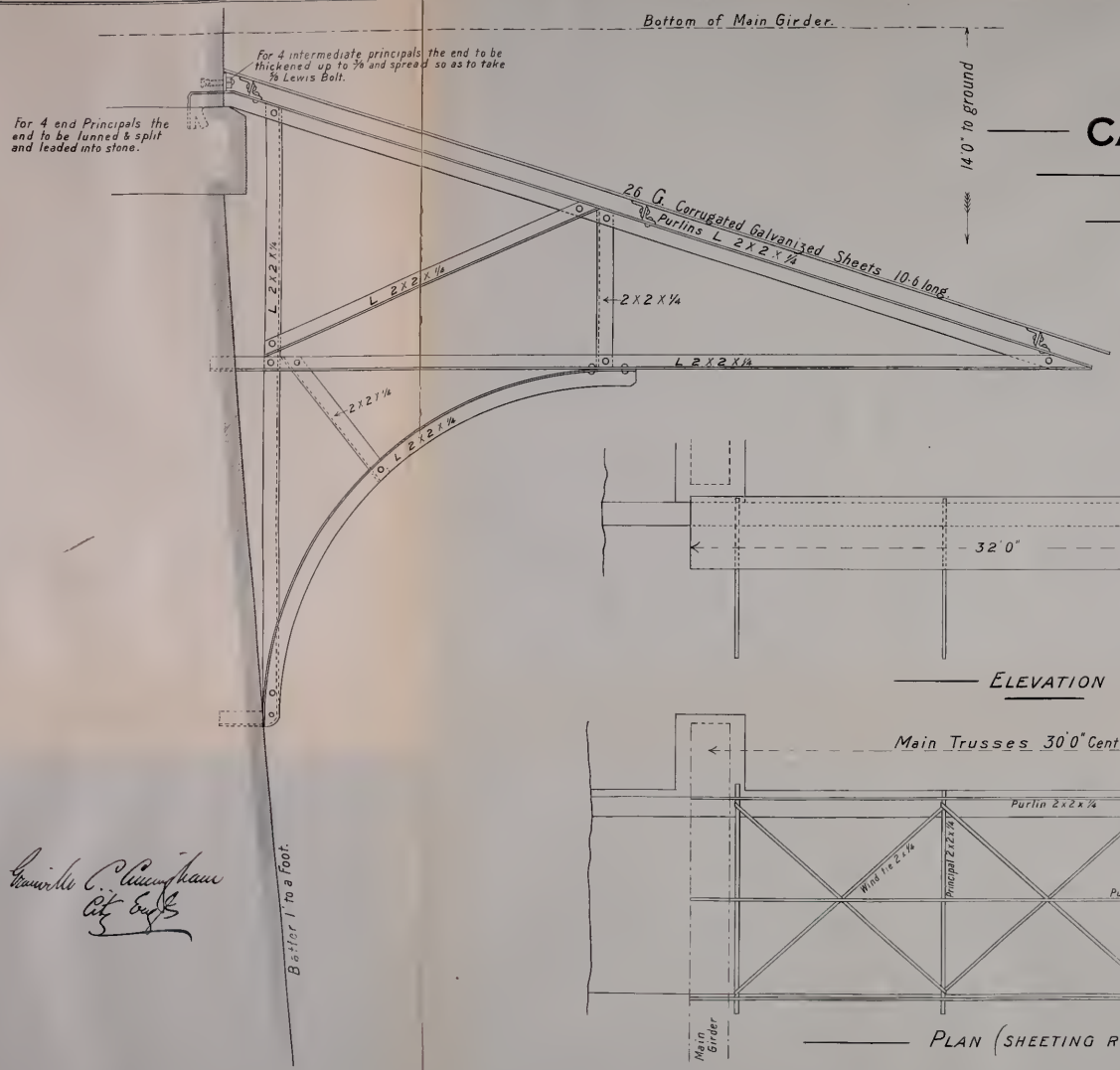
HUNTLEY STREET BRIDGE.—This bridge has been thoroughly scraped and repainted (two coats). I examined the deck and kerbs of this bridge and found them to be in a very rotten and dangerous condition. On removing the upper course of planks, the lower three inch planks were found to be tolerably sound—the joists in all cases were good; the three inch planks were all taken up and turned over (the rotten ones discarded) and again spiked down leaving one inch space between each for drainage; the kerb was nearly all removed and replaced by new; on the three inch planks rising pieces were placed 2.6 centres, giving a crown of four inches to the roadway, upon these new three inch planks were spiked diagonally; three inch cast iron drain pipes were placed in gutters to carry off the water; the sidewalks were repaired where required: the handrail straightened up and made secure. This bridge is now in a thoroughly good condition.

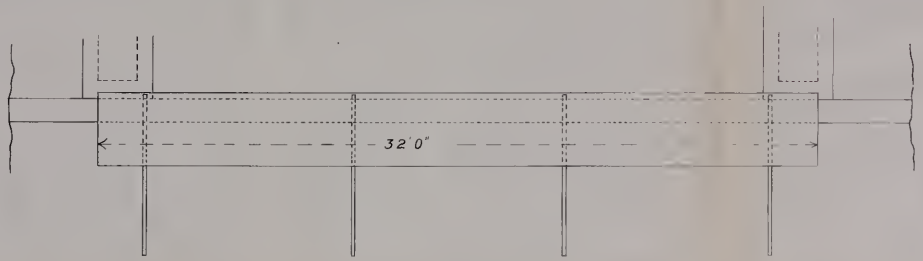
CARLAW AVENUE SIDEWALK SHELTERS.—Complaint having been made that foot passengers were being very much inconvenienced by drip from the bridge, shelter roofs were designed and erected over each sidewalk, these are properly secured to the abutment walls and carry all drip into the street. The whole was thoroughly painted so that now the sidewalks keep perfectly dry as far as drip from the bridge is concerned..

CARLAW AVE BRIDGE.

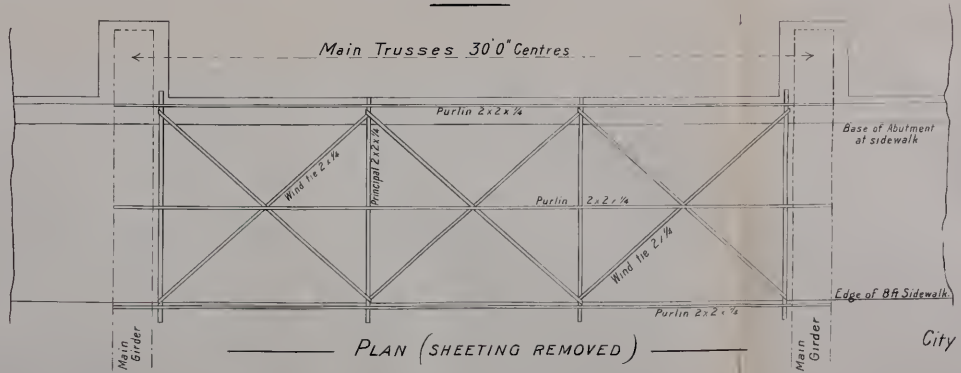
Sidewalk Protection

Scale 1 inch & ¼ inch to a foot.


Bottom of Main Girder.
For 4 intermediate principals the end to be thickened up to ⅞ and spread so as to take ⅞ Lewis Bolt.
For 4 end Principals the end to be funned & split and leaded into stone.
14'0" to ground
26 G. Corrugated Galvanized Sheets 10.6 long.
Purlins L 2 X 2 X ¼
L 2 X 2 X ¼
2 X 2 X ¼
L 2 X 2 X ¼
2 X 2 ¼
L 2 X 2 X ¼
L 2 X 2 X ¼
Batter 1 to a Foot.



ELEVATION


Main Trusses 30'0" Centres
Purlin 2 x 2 x ¼
Wind Tie 2 x ¼
Principal 2 x 2 x ⅜
Purlin 2 x 2 x ¼
Wind Tie 2 x ¼
Purlin 2 x 2 x ¼
Base of Abutment at sidewalk
Edge of 8ft Sidewalk.
Main Girder
Main Girder

PLAN (SHEETING REMOVED)

Roof 32 Ft long on both sides of Bridge.

Granville C. Cunningham
City Engr

J Williams, C.E.

City Engineer's Office
Toronto.
March 26. 1891.

Alexander & Cable Lith Co Ltd. Toronto

SHERBOURNE STREET BRIDGE.—The parapet and guard railing of this bridge have been thoroughly painted and charged against the contractor who left it unpainted on account of the lateness of the season when the bridge was finished. The deck was partially prepared during erection for the reception of the rails for the street railway. These rails (girder section) have now been put in and made tight with gravel and asphalt; additional drain pipes have been placed between the tracks and the devil strip.

ISLAND PARK WHARVES.—New picket fences were placed on these wharves, dividing them for the convenience of the several Ferry Companies. Six sliding gates were also placed at entrances and seats were fixed along each fence.

FREDERICK STREET WHARF.—This wharf has been extended some seventy feet further into the bay. This extra piece has been piled in and securely tied back, the inside of this making a large dumping ground for street scrapings, &c.

CATTLE MARKET SUBWAY.—Plans were prepared and estimates made for a subway under the several railway tracks to connect the proposed new Cattle Market with the present one.

KING STREET SUBWAY.—It being required by the several Railway Companies interested that the deck of this subway should be made water-tight and the open portions so protected that nothing can fall through, plans and estimates have been made and submitted, but no action has been taken in the matter.

QUEEN STREET SUBWAY.—Plans and estimates have been made for the widening of this subway on three different plans. This matis now before the Railway Committee of the Privy Council.

QUEEN STREET HIGH LEVEL SWING BRIDGE.—Plans and estimates have again been made for this bridge over the River Don on Queen Street. This matter is also before the Railway Committee of the Privy Council.

STRACHAN AVENUE BRIDGES.—These bridges have been examined and found to be in a very rotten and unsafe condition. They were recommended for renewal in 1891 at a cost of about $12,000, which amount was put in the estimates but cut out by the Executive Committee.

York Street Bridge.—Estimates were prepared for this bridge, being part of the Esplanade Agreement.

Island Park Bridges.—Examined and reported upon the erection of a new bridge across the lagoon near Island Park, in the line of Hamilton Street.

Examined and reported upon the repairs of existing foot bridges from breakwater to Canadian Yacht Club grounds. This bridge is in a very bad condition and needs renewing.

Dundas Street Bridges.—New plans were prepared early in the year for the masonry and general details; tenders were asked in July; work ordered to commence October 20th, 1891; good progress is being made with excavation and masonry.

Respectfully submitted.

JOHN WILLIAMS,
Engineer of Bridges and Special Works.

STREET COMMISSIONER'S REPORT.

TORONTO, December 31st, 1891.

GRANVILLE C. CUNINGHAM, ESQ.,
City Engineer.

DEAR SIR,—The following is a report of work done in the branch of the Works Department under my charge during the year 1891:

STREET CLEANING.—Considerable attention has been devoted to this branch of the work. The main thoroughfares, viz.: King, Queen, Yonge, Church, Front, York Streets, etc., (in order to avoid obstructing vehicular traffic) have been cleaned almost solely at night. The work is begun about 8 p.m., and completed before 7 o'clock the following morning.

The residential streets are not cleaned as frequently as the main thoroughfares. However, every precaution is taken to avoid giving annoyance to residents by dust from the sweepers, etc., the road being watered before swept. The culverts on the leading thoroughfares are cleaned in conjunction with the cleaning of the streets at night. This serves to give the streets a cleaner appearance, and the road allowance is not obstructed with piles of earth, etc., of a disagreeable nature. These streets are also patrolled by old men with bags, whose duty it is to keep the streets free from paper, etc., and during the year 2,234 bags of paper have been removed. Under this head considerable expense is incurred in addition to the work of street cleaning: for instance, while the road may be clean, the channel or gutter may be littered with debris. This is removed and the cost charged against the street cleaning account. The sweeping of crossings is another drain on this appropriation. All crossings in the down town sections of the City are cleaned before 8.30 every morning and kept clean throughout the day. During the winter season the street crossings throughout the City are cleaned of snow, etc., and, when necessary, sprinkled with cinders, sand, etc.

It has been found necessary, to avoid accidents, to remove the accumulation of snow and ice from the street intersections. Another expense on this appropriation is the cleaning of the foot-paths of the many bridges throughout the City, which number about 17.

The cleaning of the asphalt pavements by hand is a very large expense, which I think should be borne partly by the property owners and partly by the City at large. The cost of this work during the past season is $3,545.77. The mileage of this class of pavement is 6.66. The mileage of asphalt, at the close of the year 1889, was 3.11 miles. You will therefore see that the mileage of asphalt has doubled within the last two years.

The difficulty in disposing of sweepings, scrapings, etc., has given considerable trouble during the past two years, the only dumping grounds at present south of Carlton Street between the Don River and Bathurst Street, being Frederick Street Dock (Eastern Yard), foot of Lorne Street and foot of Jarvis Street. In the first part of the season considerable use was made of the dump at Tannery Hollow (Yonge Street), until the Medical Health Officer requested the Department to stop using it. Of course the scarcity of dumping grounds and the difficulty in disposing of sweepings, largely increases the cost of cleaning.

Some $3,000 was expended by order of Council in giving work to the unemployed in February last, in removing the accumulation of ice, etc., from King, Yonge and Queen Streets. This expenditure was charged against our street cleaning account.

It will readily be seen from the above that there is a large drain on the appropriation over and above the actual cleaning of streets.

The total mileage of streets cleaned is 1,925 miles, at a cost of $62,430 85, which is at the rate of about $32.50 per mile. In all fairness the cleaning of the asphalt pavement by hand and the $3,000 expended in charity, should be deducted from the expenditure of $62,430, which would decrease the cost to about $29 per mile, as no account of the mileage cleaned is taken into consideration in either of these works.

The manufacture by the Department of the street sweepers referred to in my Report of 1890 is giving the best of satisfaction, so much so that I have built eight of them, which are in constant use. These machines can be used on any class of road and clean without difficulty asphalt, stone set, cobble, wood or macadam.

It was with some misgiving as to the result that the experiment of the use of steel wire in the place of rattan was made. It was found,

however, that it answered the purpose with a much better result, and in consequence we have decided to use steel wire exclusively in the future. The use of steel is much more economical, for the reason that the brooms filled with it will outwear twelve filled with rattan. All repairs, hand-brooms, sections, etc., are made by the Department, and a large saving is thereby effected.

SNOW CLEANING.—A large amount of snow cleaning from sidewalks was done in the winter of 1890-91, the cost of which was assessed against the property in front of which the cleaning was done, as provided in By-law 2464, Section 26. This work totalled (112,397 lineal feet) 21 miles and the cost was about 1⅛ cents per lineal foot. Some hundreds of cases were taken before the Police Magistrate and a large number of convictions obtained.

A number of complaints were made by property-owners that it was unfair and unjust to both summons them in the Police Court and, in addition, assess the cost against the property. With this in view the Council this month (December) amended Section 26 of By-law 2464 to read as follows:

"In case any ice, snow and dirt has not been removed from the sidewalks and gutters, drains or water courses opposite to any vacant houses or lands, within 24 hours after any fall of snow, rain or hail, the City Engineer, or other person appointed for that purpose, may forthwith cause such snow, ice and dirt to be removed at the expense of the Corporation, and in every such case he shall keep an account of all expenses so incurred, and of the properties in respect of which such moneys have been expended; and shall make a return to the Treasurer of the City, on the first day of April in each year, of all expenses incurred as aforesaid during the preceding winter, with the number on the last Revised Assessment Roll of the property in respect of which such expense was incurred, and the names of the owners and occupants thereof, as appearing on the said Roll; and in case of non-payment thereof to the said Treasurer on or before the first day of May following, the said expenses shall be charged as a special assessment against the said properties respectively, and shall be levied and collected, with the first instalment of taxes for the current year, in the same manner as other Municipal taxes.

This change will greatly assist the Department in handling this work in future.

The citizens, however, lose sight of the fact that we cannot remove the snow from the sidewalks until 24 hours after a fall of snow. You will readily see that we are handicapped by this provision.

STREET OBSTRUCTIONS.—Particular attention has been paid this subject during the building season. An officer of this Department gave this matter almost the whole of his attention, with the result

that the main thoroughfares have been kept almost free from obstructions, which greatly decreased the possibility of accidents, etc.

A large number of builders were brought before the Police Magistrate for infringement of the By-law respecting streets, etc., but the charges not being pressed, convictions were not obtained in all cases. The amendment to By-law 2468, Section II., as provided in By-law 2938, requiring builders and others using the streets to maintain red lights on the material, etc., from sunset to sunrise, will, I am sure, be a good safeguard against accidents.

Stone Street Crossings.—These crossings to the number of 44 have been constructed during the year. They add much to the appearance of the streets, and are more easily kept clean. The stepping stones in these crossings are 14 inches wide by 7 inches deep and 2 to 3½ feet in length. These slabs are laid in rows, on a bed of gravel, about 18 inches apart. The space between them is paved with scoriae blocks and in a few cases stone setts have been used. But scoriae blocks are much cheaper and are more easily handled, besides being cleaner in appearance, while I am sure they will wear as long as stone setts. It will be necessary to construct a number of these crossings next year, and I trust the Council will see its way to appropriate funds sufficient to cover the cost of constructing 20 to 25 of them.

The following is a list of crossings constructed during the year:

Street.	Side.	Across.
Church	East	Adelaide.
"	West	"
"	East	Colborne.
"	"	Lane bet. Colborne and Front.
Colborne	North	Leader Lane.
College	"	Robert.
"	"	Major.
"	South	Augusta.
"	"	Bellevue.
"	"	Bathurst.
"	"	Lippincott.
"	North	Brunswick.
"	South	Spadina.
King	South	Leader Lane.
"	"	Bay.
"	North	Victoria.
"	"	Jarvis.
"	"	Bay.
"	South	Theatre Lane.
Spadina	East	Phœbe.
"	"	Grange.
"	"	Cecil.
Spadina	East	Bulwer.
"	West	Nassau.
"	"	Oxford.
"	"	College.
Queen	North	Spadina.
"	South	Bay.
"	"	Esther.
"	North	Vanaulay.
"	"	Denison.
"	"	Hackney.
"	"	Esther.
"	"	Cameron.
"	South	Spadina.
"	"	Portland.
"	North	Dundas.
"	South	Macdougall's Lane.
Yonge	East	Ann.
"	West	Agnes.
"	East	Gould.
"	"	Wilton.
"	"	Adelaide.
York	"	Wellington.

WOODEN CROSSINGS.—A number of crossings have been constructed of tamarac blocks and have given satisfaction. I propose to construct these crossings, where it is desirable to have a crossing of a more durable nature than ordinary wooden crossings, but at the same time less expensive than a stone crossing.

The ordinary wooden crossings have received considerable attention during the year and precautions have been taken to remove all that were worn and dilapidated. As some of these crossings are giving out every day you will see that watchfulness is necessary to keep them in order.

CURVED STONE CORNERS.—At a number of places throughout the City it was found necessary to construct curved stone corners as a convenience to vehicular traffic. The following are the localities improved, after this fashion, during the year, with cost:

North-east corner of York and Wellington Sts.	$33 40
South-east corner of King and Jordan Sts.	8 40
North-east corner of Bay and King Sts.	44 34
North-east and North-west corners of Leader Lane and Colborne St	14 18
Corner of Church and Adelaide Sts.	41 78
North-east and North-west corners of Victoria and King Sts.	17 30
Corner of York and Queen Sts.	35 84
North-east and North-west corners of St. George and College Sts.	41 04
Corner of Spadina Av. and College St	48 45
South-east and South-west corners of Bloor St. and Spadina Av., kerbing re-set at new radius.	

STREET OPENING PERMITS.—Permits under this head to the number of 73 have been granted during the year. The manner of issuing these permits is as follows: Application is made to this Department for a permit, when the person requiring same states the reason he purposes raising the sidewalk, and, if considered satisfactory, the permit is issued upon a deposit being made with the City Treasurer of $10. and the applicant signing a statement that he will be responsible for any and all accidents that may occur at the place concerned, owing to the opening of street. When the street is restored to the satisfaction of the District Foreman, the deposit of $10 is refunded by the Treasurer on an order from this Department.

CULVERTS AND GULLIES.—Culverts and gullies have been cleaned throughout the City during the year on an average of eight times each. There is altogether between 6,500 and 7,000 culverts and

gullies, the cleaning of which, at eight times per annum each, gives a total of 56,000 cleaned during the year. In addition to this work a number of old culverts were found defective and have been rebuilt etc. Few complaints have been made regarding choked or foul-smelling culverts.

YARD ACCOMMODATION.—I would strongly urge that a yard of larger size be procured in place of the Bathurst Street yard. The last two seasons we have been cramped for room. I would recommend that a piece of ground be purchased or leased with about 200 or 250 feet frontage, three or four blocks west of Bathurst Street, as near College Street as possible, or further west, with railway sidings.

WOOD SIDEWALKS.—The repairs of wooden sidewalks is a large item in the expenditure of this Department. Every care is taken to keep the walks in good condition. We are troubled, however, a great deal, particularly in the spring and fall, by vehicles laden with coal and wood being driven over the walks, which of course damage them more or less. Where the walk has been down for some time the planks are invariably broken. I am sure a large number of accidents could be traced to this source.

A large number of the walks have been placed next the kerb on petition. This has its disadvantages as well as advantages. Being next the kerb pedestrians are liable to be sprinkled with water from watering carts, and children in playing on the walk run a greater risk of being injured by vehicles than they otherwise would.

As local improvements 196 sidewalks were constructed. (See Accountant's Statement, page 37, Appendix "A," for detail statement.) Of this number 44 were walks constructed for the first time. The remaining 152 replaced walks that were worn out.

The mileage of walks constructed amounts to 31.341 miles, divided as follows:

3 feet	.145	miles.
4 "	3.858	"
5½ "	5.378	"
6 "	19.267	"
7 "	.087	"
8 "	.489	"
10 "	.595	"
12 "	1.522	"
	31.341	"

The following table shows the cost per lineal foot of material, labor in handling and constructing, interest, etc., and average cost of different widths of walks:

Width.	Material.	Labor, Interest, etc.	Average cost.
	Per lineal foot.		Per lineal foot.
4 feet.....	14 cents.	8 cents.	22 cents.
5½ "	17 "	9 "	26 "
6 "	21 "	10 "	31 "
10 "	33 "	13 "	46 "
12 "	40 "	19 "	59 "

From this you will see that the cost is very low, taking into consideration the price of material, etc.

Wire nails, five inches long, have been used this year to a large extent and have been found to be superior to the cut nails formerly used. In repairing, these nails have been removed from the old walks and used again. The frost, I think, will not raise them as much as it does cut nails.

CEDAR BLOCK ROADWAYS.—Special attention has been paid to this class of pavement during the past year. The main thoroughfares viz., King, Queen and Yonge Streets, have been repaved as follows:

Queen Street, both sides, from Yonge to Bathurst Street.
Queen Street, north side, from Bathurst Street to Euclid Avenue.
King Street, both sides, from Bathurst to Sumach Street.
Yonge Street, both sides, from King to Edward Street.
Yonge Street, east side, from Edward to Gould Street.
Front Street, south side, from Yonge to Scott Street.
College Street, both sides, from McCaul to Ross Street.
King and Queen Streets also, at their intersection with the Don River, have been repaved.

The total number of yards of reconstruction on these streets is 80,473, divided as follows:

Queen Street	23,707	square yards.
Front "	720	"
King "	41,534	"
College "	4,207	"
Yonge "	10,305	"

The average cost of the work, throughout, including "toothed" stone setts along the street railway tracks is about 35 cents per square

yard. The work was done as rapidly as possible, with a view to the least impediment to vehicular traffic. That this was effected is apparent from the fact that not one complaint was received during the time the work was being done.

The best of the old blocks removed from the old pavements were used in this work, from the kerb outward from three to five feet.

The track allowance from Dovercourt Road to Roncesvalles Avenue, on Queen Street, was gone over and repaired with a mixture of old and new blocks; the "devil-strip" being cobble paved at points that were considered necessary, owing to the raising of the blocks during the winter season.

If the change of the system of the Street Railway is not made next year the road allowance between the tracks on the main thoroughfares throughout the City will require to be renewed. At present the pavements are in a very worn condition.

Ossington Avenue, just north of Dewson Street, where the bridge over the ravine formerly stood, which had been filled in by material taken from streets paved in the locality, has been kerbed and blocked at a cost of $609.65, which is 97½ cents per square yard.

The pavement on College Street, east of Shaw Street, which had settled somewhat, has been raised to the proper grade at a cost of $771.81, an average of 71 cents per square yard. As in my Report of 1890, I have again to draw attention to the condition of the block pavements on a large number of residential streets, notably in the north-eastern and western sections of the City. If you remember, you and I went over the worst of these streets and recommended to the then City Engineer, Mr. Jennings, that they be re-paved. This, I understand, was recommended by the City Engineer as a local improvement and endorsed by the Committee on Works, but was referred back by Council for further consideration. Of course the condition of these streets has not improved since our inspection. It is absolutely impossible to repair them and I would strongly urge that they be reconstructed during the coming season. I would instance the following streets:

Street.	From.	To.
Winchester	Parliament	Ontario.
Prospect	Rose Avenue	Parliament.
Amelia	Sumach	"
D'Arcy	Beverley	McCaul.
Baldwin	"	Spadina Avenue.
Cecil	"	"
Henry	Baldwin	Cecil.
Bellevue	College	Bellevue Place.
Orde	120 feet east of McCaul	East end.
St. Patrick	McCaul	Spadina Avenue.
Sullivan	Beverley	"
Grove Avenue	Dundas	Foxley.
Northcote	Queen	Saurin.
Lisgar	"	Dundas.
Argyle	Dundas	Gladstone.
Saurin	Northcote	Lisgar.
Nassau	Spadina	Lippincott.

I might mention, however, that these streets are not all in the same condition. Of the above list, Grove Avenue, Winchester, Saurin, Prospect and Amelia Streets are the worst. Most of these pavements were constructed in 1882, from which you will see that they have stood the lifetime as recommended. I understand the payment of assessments on these pavements expires next year.

I would also urge that King Street be re-paved, from Bathurst to Niagara Street: and Queen Street, from Bathurst to Gladstone Avenue; and Yonge Street, from Gould to Wellesley Street. I would also recommend that Dundas Street be cobble-paved between the tracks, from Queen Street to Ossington Avenue, to connect with the cobble paving from that point west. There is considerable fall to this street and the block pavement is not in the best condition.

Cobble Paving.—A large amount of repairs have been made to this class of pavement throughout the City, and considerable paving done between the tracks, the following streets in particular:—

College Street, from Spadina Avenue to Bathurst Street, both tracks.
King " near Peter Street, " " "
Frederick " from King to Front Street, both tracks.

The average cost is 76 cents per square yard.

Stone Sett Paving.—This branch of roadway work has consisted mainly of repairs. Stone sett intersections have more or less received

attention and are now in fairly good condition. The intersection of King and Yonge Streets, if permanent pavements are not laid next year, will require to be relaid, owing to the Medina setts (of which it is composed) being rounded.

The north track on King Street, between Toronto Street and Church Street, has been re-paved with setts at a cost of $470.68, and the stone pavement, from the intersection of King and Yonge Streets was extended west between the tracks some 40 feet, at a cost of $62.34.

Asphalt Paving.—The asphalt pavements are in good order. A number of openings have been made for sewer, water and gas services and repairs, the pavement being replaced by the contractor who constructed it, and the cost borne by the Department or Company making the opening.

Macadam.—Roadways of this class have received considerable attention, as will be seen by the amount expended, etc. The quantity of stone used for macadamising is 894.26 toise, the cost of which, including breaking at $6 per toise, is $9,456.65.

303.87 toise were gathered by the Department during the year, the saving to the City in this direction being about $2,430.

Considerable coarse gravel has been used on lightly travelled residential streets, and streets of this nature are now, I think, in a much better condition than they have been for some years past.

The following is a statement showing the contractor, quantity of stone delivered, with total cost, including breaking:

STATEMENT OF MACADAM STONE DELIVERED DURING 1891.

Contractor.	Quantity.	Cost per Toise.	Total, including cost for breaking, per Toise.
		$ c.	$ c.
Burns & McCormack	12.80	10 00	204 80
R. Goldring	105.24	9 80	1,662 79
J. Goldring	1.49	10 80	25 05
James Hilts	52.54	9 00	788 10
T. O'Connor	11.11	10 00	177 76
A. W. Godson	2.66	10 90	44 95
"	2.83	9 00	42 45
"	2.24	11 00	38 08
C. Farquhar	4.62	10 00	73 92
John Matthews	3.56	8 00	49 84
"	34.47	10 00	551 52
E. Goldring	100.46	9 80	1,587 27
F. McKeown & Co	22.70	12 99	431 07
T. H. Williams	12.86	9 80	203 19
J. T. Matthews	12.07	10 00	193 12
P. Wilson	79.08	10 00	1,265 28
S. Cook	24.96	12 00	449 28
E. Adamson	5.10	9 80	74 58
	490.79	.....	7,863 05

GENERAL ROAD REPAIRS.—Considerable repairing to mud roads has been done, particularly on streets between the time they were sewered and paved. This work has been done with very good effect.

STREET TABLETS AND NUMBERING.—A great deal of street numbering has been done, particularly on streets that have been extended and where the frontage has been turned from adjoining streets. Street tablets have been erected where required. Difficulty is experienced in placing them on posts, as they are liable to be defaced and torn down.

COMPLAINTS.—The complaints received at the office, concerning sidewalks, roadways, culverts, etc., numbered 1,574. A large number of these appertained to works of other departments, to which they were forwarded for disposal.

MATERIAL.—The following is a statement of lumber, nails, etc., used by the Department during the year:

Lumber	3,435,498 ft., B. M.
Nails	91,260 lbs.
Granite Setts	57,779 setts.
Cedar Blocks	3,227 cords.
Lake Gravel	3,763 cubic yds.
Crossing Stone	4,473⅓ ft.
Gutter Stone	285⅓ ft.
Circular Stone Kerbing	98½ ft.

Yours faithfully,

JOHN JONES
Street Commissioner.

APPENDIX "A."

ACCOUNTANT'S STATEMENT.

CITY ENGINEER'S OFFICE,
December 31st, 1891.

G. C. CUNNINGHAM, ESQ.,
City Engineer.

DEAR SIR,—

I attach statement showing expenditure for the year ended December 31st, 1891.

Yours truly,

JAMES F. HILL,
Accountant.

GENERAL STATEMENT.

Page		$ c.	$ c.	$ c.
25	Vouchers certified for pay't as per list			1,246,638 73
	Balance 31-12-90 included in ditto		9,862 90	
	" 31-12-91 Sidewalk account		1,921 27	
3	General and special works	361,501 23		
3	Local improvement works	790,871 40		
4	Departmental and personal accounts.	41,178 91		
			1,193,551 54	
	Sundry accounts charged in 1889 and 1890, charges being cancelled or corrected in 1891, viz :			
	Sherbourne St. bridge, M. H. Hasler	187 06		
	" " W. T. Kiely.	36,180 00		
	Victoria Street ext'n, R. Greenwood	726 00		
	" " M. E. Thomson	774 00		
	Gerrard St. subway, R. Macdonald	2,308 59		
	Yonge Street sidewalk, McKeown & Challis	1,107 37		
	Garrison Creek sewer, M. Thomson	20 00		
			41,303 02	
				1,246,638 73
44	Material, etc., on hand Stores Department, per inventory		20,867 21	
47	Plant and tools, "		15,744 70	
				36,611 91

For Abstract of Charges see Page.	ACCOUNT.	$ c.	$ c.	$ c.
	GENERAL WORKS.			
5	Bridges, repairs and maintenance.....	5,279 19		
5	Engineering and general expenses	23,428 95		
6	Kerbs, repairs and re-construction....	2,800 37		
6	Private drains.....	5,423 08		
7	Roadways, repairs and maintenance...	101,779 17		
8	Sidewalks, " " ..	18,493 60		
9	Street cleaning.....	62,494 78		
9	Stone street crossings, construction of .	7,773 72		
9	Wooden crossings, repairs and maintenance	1,812 33		
11	Sewers and Culverts and Miscellaneous (1890. Liabilities, $17,178 70)	49,681 15	278,966 34	
	SPECIAL WORKS AND SERVICES.			
11	Ashbridge's Bay survey	179 58		
11	Dredging sewage, etc	2,254 87		
12	Don River improvements	5,706 88		
12	Engine, boiler and machinery	22 00		
12	Frederick Street wharf, extension and repairs	2,810 05		
12	Garrison Creek sewer, College to Bloor.	18,952 50		
13	" " Ossington to Bloor	6,120 29		
13	Jarvis Street sewer, re-construction....	4,678 14		
13	King Street subway	27,649 29		
13	Queen " ..:.....	135 00		
14	Rosedale Creek sewer.....	10,977 23		
14	Sewer extension to Windmill Line	2,898 64		
14	Yonge Street sewer, reconstruction of.	150 42	82,534 89	
16	....	.....	361,501 23	
	Local Improvements : .			
16	Pavements, per list, p.p. 26-29....	384,011 22		
17	Sewers, " 30-33....	179,476 42		
18	Sidewalks, " 35-42....	125,948 02		
18	Gradings, Extensions, etc., per list, p.p. 34	101,435 74	790,871 40	
19	DEPARTMENTAL AND PERSONAL ACCOUNTS OUTSTANDING DECEMBER 31ST, 1891			
	Armstrong, A.....	8 95		
	Atheneum Club	32 50		
	Canadian Pacific Railway Co.....	304 02		
	Cruise, G. W.....	9 00		
	City Commissioners department	6 90		
	Court House committee.....	1,375 27		
	Consumers Gas Co.....	25 25		
	Clarke, C. H. & Co	103 63		
	Cathro, W. H.....	90 00		
	Dominion Bridge Co	53 80		
	Carried forward	2,009 32	1152372 63	

For Abstract of Charges see Page.		$ c.	$ c.	$ c.
	Brought forward	2,009 32	1152372 63	
	Grand Trunk Railway Co	26 99		
	Gooderham, George	81 25		
	Incandescent Electric Light Co	387 46		
	Leak & Co	79 85		
	Leybourne, A	30 00		
	McKeown & Co	821 73		
	McNally & Co	5 95		
	McWilliams, G. W	4 00		
	Medical Health Department	248 10		
	Parks Department	72 50		
	Reynolds, W	25 22		
	Toronto Street Railway	27 00		
	Water Works Department	29 31		
	Van Vlack, D. L	21 56		
	Treasurer's Department	37,308 67		
			41,178 91	
20				1,193,551 54

Bridges—Repairs and Maintenance.	$ c.	$ c.	$ c.
Lumber, 106,801 feet B. M.	1,601 88		
Nails and spikes, 75 kegs	228 96		
Tie rods, bolts and washers	165 91		
Iron pipes, 1,032 lbs.	39 60		
Paint and Oil	110 63		
Stone, 1 toise	10 82		
Notice boards, 2	6 50		
Painting Huntley and Glen Rd. Bridges	450 00		
Piling Winchester Street Bridge	133 42		
" Don River near Winchester St. Bridge	253 92		
Screws, iron and sundry supplies	38 55		
Advertising	3 00		
Brushes, brooms, etc	88 35		
Labor, work on bridges	2,077 15		
" Engineer's assistants	70 50		
Notice boards $ 6 50			
Arthur Street Bridge 191 52			
Bloor " " 46 74			
Eastern Ave. " 333 30			
Gerrard Street " 86 82			
Glen Road " 1,094 95			
Huntley Street " 1,300 54			
Queen " " 130 07			
Sherbourne St. " 361 54			
Winchester " " 1,727 21			
	$5,279 19		
			5,279 19
Engineering and General Expenses.			
Horse, harness, cutter, robe and rug	273 00		
Keep of horses, car tickets and cab hire	1,547 22		
Horse-shoeing and repairs to buggies	230 24		
Type-writer, drawer, engineering and general office supplies and repairs to instruments	626 93		
Postage stamps, petty expenses and messenger service	319 66		
Services re College Street surveys and interviewing property owners	92 90		
Registry Office fees for searches, etc	13 10		
Patent Office, Specification Carson sewer machine	4 50		
Books $59 ; Subscription to journals $28.54	87 54		
Insurance plan and maps Toronto	124 00		
Advertising	1,251 30		
Salaries, Engineering Staff	35,478 18		
		40,048 57	
Cr.			
Medical Health Dept. for smoke tests, etc	588 75		
Sundry persons for smoke tests etc	20 00		
Charged Local Improvement Works	16,010 87		
		16,619 62	
(1890. Liabilities, $3,277.00.)			23,428 95
Carried forward			28,708 14

	$ c.	$ c.	$ c.
Brought forward			28,708 14
KERBS—REPAIRS AND RECONSTRUCTION.			
Cedar posts	58 55		
Lumber, 54,138 feet B.M.	709 26		
Nails, 12½ kegs	39 38		
Gravel, 9 yds.	11 07		
Stone kerbing, 1229 feet. $869 48			
Less Charged L. I. Works 1026 feet. 626 37			
203 feet.	243 11		
Tools	1 75		
Unloading and hauling posts, etc	23 70		
Wages, work on kerbs	1,606 38		
" Supervision	107 17		
		.....	2,800 37
PRIVATE DRAINS.			
Pipes, 40,591 feet	5,200 95		
Junctions, bends, reducers, etc	285 42		
Closed manhole cover, 514 lbs	11 56		
Bricks, sand and cement	679 28		
Lumber	111 35		
Sharpening tools	88 96		
Hauling Cement	97 77		
Oil, lanterns, globes, etc	108 30		
Tools, hose, etc	303 62		
Rubber boots $26.10, car tickets $5	31 10		
Water Works charges	25 93		
Constructing drains and drawbacks 1889 and 1890	4,097 66		
Constructing drains, 1891	333 11		
Repairing private drains 1890 and 1891	153 65		
Refunds of deposits (Orders to Treasurer $843.42 ; paid by vouchers $458.13)	1,271 55		
Wages :			
Work on new drains and repairs to drains and pavements	13,644 27		
Inspectors	5,141 75		
		31,586 23	
CR.			
Charged Roxboro' Ave. and Palmerston Ave. pavements for drains constructed	669 70		
Deposits to Treasurer for drains	25,493 45		
		26,163 15	
(1890. Liabilities, $4,343.28.)			5,423 08
ROADWAYS—REPAIRS AND MAINTENANCE.			
Gravel and sand, 9,107½ yards	8,889 81		
Loam, 1077½ yards	903 88		
Carried forward	9,793 69		36,931 59

	$ c.	$ c.	$ c.
Brought forward	9,793 69		36,931 59
Cobble stone, 80½ toises	897 99		
Macadam stone, 879 toises	6,305 26		
Scoria blocks, 2,086	142 10		
Granite blocks, 4,252 yards	8,313 72		
Cedar kerbing, 18,252 feet	182 75		
" posts, 3,764.66 cords	20,659 08		
Tamarac plank, 38,543 feet	482 02		
" posts, 33.62 cords	258 51		
Cutting and hauling cedar	4,222 24		
Hauling granite setts	70 00		
Drawbacks, cedar, gravel and stone 1890	1,453 09		
Miscellaneous, lumber, spikes, bolts, etc	350 65		
Belting, lanterns, globes, oil, etc	151 60		
Roller, hose and couplings, pounders, levels, etc	415 60		
12 notice boards	18 00		
Steel figures (bench marks)	9 13		
Coal, cinders and sod	15 07		
Rent, Yards and Hamilton's wharf (prop'n)	726 58		
" Telephones, Yards	60 40		
" and repairs engine, cutting posts, 1890 and 1891	513 89		
Water Works charges	17 25		
Horse keep, horse hire for paymaster, repairs to buggy and horse shoeing	139 31		
Excavating, Pears Avenue 212 cubic yards	21 20		
Siding Parkdale and rental for 1891	397 21		
Charges on account, local improvement pavements made after By-laws passed	346 76		
Charges on account, local improvement, St. George Street, refilling and making trenches	438 00		
Cleaning out w. c. cor. College and Yonge	10 00		
Labor, work on cedar block pavements	21,466 10		
" " macadam roads	14,869 75		
" " stone setts	940 87		
" " cobble stone	4,031 45		
" channeling, ditching and general road repairs	2,971 89		
" cutting posts and miscellaneous	2,230 51		
" putting up bench marks	92 00		
" grading Hoskin Avenue extension	620 31		
" counting loads, Pears Avenue	75 00		
" inspecting repairs L. I. pavements	116 96		
		103,825 94	
Cr.			
Charged local improvement pavements, cutting and hauling posts, etc., 1890 and 1891	2,005 47		
Charged sundry persons, labor, crossing and cobble stone	33 14		
Charged L. I. pavements, gutter stone	2 16		
" J. Feighen, logs, Hoskin Avenue	6 00		
		2,046 77	
(1890. Liabilities, $4,594.96 net.)			101,779 17
Carried forward			138,710 76

	$ c.	$ c.	$ c.
Brought forward			138,710 76
SIDEWALKS—REPAIRS AND MAINTENANCE.			
Rebate, McMath, stone flag corner Queen and O'Hara Avenue	104 60		
Rebate, W. Reynolds, granolithic walk Gould and Yonge	60 00		
Allowed Scott, damages by lowering walk, Ossington Avenue	75 00		
Crushed Granite, $4 ; Wood preservative $10	14 00		
Lime, $5.20 ; cement, $2.80 ; loam, $11.40	19 40		
Sod, Sherbourne, Bloor and Balmuto Streets	17 88		
Horse hire and horse keep, paymaster and storekeeper	87 08		
Rent, yards	417 50		
Stove, yard office, $9.50 ; coal, $8.50	18 00		
Sharpening saws, $100.75 ; repairing plow, $4.50	105 25		
Water Works charges	62 17		
Saws, lines, oil, etc	27 26		
Pine and oak $55.29 ; iron, bolts, nuts and spikes, $17.86; cedars, $4.50; wheels, axles, spokes and boxes $23.55	101 20		
Labor and material, Mrs. Cameron's granolithic walk, corner Church and Carlton streets	60 17		
Advertising	16 00		
Wages, work on walks	11,713 45		
" supervision	606 38		
" Inspection walk Gould and Yonge	35 63		
Lumber, 463,265 feet B.M.	5,823 24		
Nails and spikes, 256 kegs	806 40		
Gravel, 1 yard	1 23		
		20,171 84	
CR.			
Deposits to Treasurer for new walks	1,116 43		
Charged L. I. sidewalks for supervision	561 81		
		1,678 24	
STREET CLEANING.			18,493 60
Plant, Tools and Repairs :			
Paid repairs to sweepers and refilling brooms	412 10		
" rattan, 4,637½ lbs., $1,046.75 ; steel wire, 1,250 lbs., $201.50	1,248 25		
" wood and iron work, etc. for sweepers and sprinklers	1,817 87		
" iron, shafting, axles, wheels, etc., for ditto	353 86		
" sections and patterns for ditto	285 02		
Vice, bellows and anvil, shovels, hammers, barrow, chain, hose, etc	307 34		
	4,424 44		
Carried forward			157,204 36

	$ c.	$ c.	$ c.
Brought forward	4,424 44		157,204 36
Material used building blacksmith's shop	403 55		
Oil, paint, iron bars, lamps, bolts, turps, etc.	366 57		
Coal	42 00		
Advertising re snow cleaning, 1890	126 45		
Expenses, Street Commissioner, to Markham re sprinklers	2 75		
Rent of yards, Marion Street and St. Clarence	31 25		
Wages, general work	55,360 20		
" plant and tools	527 47		
" on blacksmith's shop	144 11		
" supervision, proportion	1,564 87		
		62,993 66	
Cr.			
Toronto St. R'y, use of sweeper and repairs	112 10		
Corp'n of Montreal, steel broom for sweeper	37 46		
City Commissioners Department, 2 watering wagons and 4 sprinklers for carts	349 32		
		498 88	
(1890. Liabilities, $607.63.)			62,494 78
Stone Street Crossings—Construction of.			
Crossing stone, 4,769 $\frac{3}{4}$ feet	1,771 83		
Gutter stone, 375 $\frac{5}{12}$ feet	135 03		
Stone kerbing, 91 $\frac{2}{12}$ "	72 24		
Scoria blocks, 37,876	2,133 84		
Granite setts, 1,292	107 13		
Crossings, 425$\frac{4}{9}$ yards	1,278 41		
Bricks, $7.53 ; pipes and junctions, $5.66	13 19		
Cement, $16.80 ; gravel 123 yards, $144.77	161 57		
Paving bricks 1,500	39 00		
Unloading stone, $9 ; hauling cement, 30c	9 30		
Freight (collected from shipper in 1890)	11 25		
Tape line	3 00		
Water Works charges	2 75		
Wages, work on crossings	2,035 18		
			7,773 72
Wooden Crossings—Repairs and Maintenance.			
Lumber, 71,658 feet	931 21		
Nails and spikes, 45$\frac{1}{2}$ kegs	118 69		
Wages, work on crossings	658 60		
Supervision, proportion	103 83		
			1,812 33
Sewers and Culverts and Miscellaneous.			
Castings : Manholes, manhole covers and steps, culverts, culvert and railway grates, 86,074 pounds	2,040 06		
Carried forward	2,040 06		229,285 19

	$ c.	$ c.	$ c.
Brought forward	2,040 06		229,285 19
1 Metcalfe culvert, $8.50; 52 catch pails $156	164 50		
146 traps, $585; 20 St. George gullies, $510	1,095 00		
6 Smith's gullies, $78; 4 Syphons, $240.12	318 12		
1 pattern syphon, $57.20; 1 pattern gulley $20	77 20		
3 manhole frames, $20.38; hook staple, etc., $7.70	28 08		
	3,722 96		
Galvanized iron pipes, 11 in. and 15 in	103 50		
" " sewer gates and flap valve	9 50		
Pipes, 2381 feet	765 95		
Junctions, bends, etc	146 18		
Inverts	1,653 24		
Cement, 2,414 barrels	6,495 97		
Bricks, 226,540	1,836 71		
Sand, 454 yards	486 97		
Stone, 1 toise $10; cross'g stone, 6 ft, $2.16	12 16		
Scoria blocks, 825, $49.74; lime $4	53 74		
Lumber, 59,230 feet	806 87		
Stone for Sump, Bellmouth, etc	85 80		
16 T girders $59.10; 1 flush tank $6.50	65 60		
Drawback, sand, pipes, castings, bricks and cement delivered in 1890	1,569 87		
Water works charges	1,254 92		
Sharpening picks $51.82; hauling cement $40	91 82		
600 feet hose $330; shovel handles, pounder axes $54.25; safe storekeeper's office $68, forge $6, scales $12, stove $5; scythes, stones and ladder $8.30	483 55		
Rubber boots, pants and jackets	227 35		
Oil, lamps, globes, gasket, speaking tubes, etc	571 88		
Moving office from Frederick street yard to Portland Street and putting up stove	24 90		
Horse hire, account putting up tablets	56 25		
Horse hire, paymaster, keep of horses, repairs to buggies, horseshoeing, boat hire, etc	1,055 05		
Street tablets and Nos, nails and rivets	54 65		
Rent telephone, yard $35.40; P. O. box $2.34	37 74		
Sod	3 37		
Messenger service 70c, advertising *re* annual supplies, etc., $100.45	101 15		
Lithographs, maps and plans *re* roads, culverts, etc	531 65		
Lake Currents:			
Tug and boat hire $696.75; floats, rope, flags, canvas, lumber, painting, etc., $134.55	831 30		
Lumber and hauling for Island groynes	35 52		
Draining Murray's property, Queen Street	632 38		
Carried forward	23,808 50		229,285 19

	$ c.	$ c.	$ c.
Brought forward	23,808 50		229,285 19
Opening drain on Barton Avenue	4 00		
Making sewer bottom Ossington Avenue	11 63		
Work on Front Street sewer (charge made after By-law passed)	90 50		
Services Lough, Carr and Armstrong, valving etc	69 45		
Search *re* Rhoades Automatic Siphon	10 00		
Paid Lavelle damages, accident through defective walk opposite Quebec bank	125 00		
Putting up hydrant Frederick Street yard	26 60		
Covering pipe, Polton hall	6 00		
Wages :			
Weed cutting $933.14, street numbering $36.87, and culvert cleaning $4,173.60	5,143 61		
Construction and repairs, manholes and culverts	5,366 57		
Maintenance and repairs of sewers	9,176 49		
Cleaning and flushing	4,167 42		
Counting areas	129 00		
Account, lake currents, making floats	25 75		
Miscellaneous	1,573 72		
Supervision	557 88		
		50,292 12	
CR.			
Tomlinson & Son, scrap iron 21,840 lbs	163 80		
Lyman Bros. & Co., copperas 6,559 "	32 75		
Gardner & Co., culvert grate	4 00		
Drawbacks payable for pipes, etc	220 42		
Bell Telephone Co., inspection charges 1890	190 00		
(1890. Liabilities, $4,355 83.)			
		610 97	
			49,681 15
ASHBRIDGE'S BAY SURVEY.			
Wages, Engineer's assistants	177 08		
Cab hire	2 50		
			179 58
DREDGING SEWAGE, ETC.			
Wages, Inspector	213 00		
R. Macdonald, dredging	2,041 87		
			2,254 87
DON RIVER IMPROVEMENTS.			
Wages :			
Engineer's assistants	890 48		
Repairing life chains; levelling box drain at Davies' brewery and hauling lime to Front Street dump	304 36		
Carried forward	1,194 84		281,400 79

	$ c.	$ c.	$ c.
Brought forward	1,194 84		281,400 79
Lumber, 8,926 feet	115 55		
Spikes, 4 kegs	17 15		
Boat and scow hire	8 50		
Medler & Arnot, account Queen Street sewer and repairing filling at mouth of drain	165 37		
Land, damages, fees and expenses in law suit	4,205 47		
			5,706 88
ENGINE, BOILER AND MACHINERY FOR CUTTING BLOCKS, ETC.			
One 40-inch saw	18 00		
Advertising for tender for engine and boiler	4 00		
			22 00
FREDERICK STREET WHARF EXTENSION AND REPAIRS.			
Street Piling, 220 feet, lineal	1,232 60		
Lumber, 52,441 feet B. M.	869 71		
Spikes, nails, nuts, bolts and washers	106 69		
Files, packing and oil	4 63		
Wages	597 02		
			2,810 05
GARRISON CREEK SEWER.			
College to Bloor.			
Contract work	16,857 99		
Land, damages and expenses	742 50		
Cement $358.40; bricks $58.90; sand $22.07	439 37		
18-inch pipes $3.05; 2 traps $8; culvert grates 540 lbs., $12.15	23 21		
Steel door, iron frame and wrought iron	64 76		
Rubber boots $4.25; levels, suckers, oil, etc. $13.83	18 08		
Lumber $58.54; stone cutters time at Bloor Street culvert $1.30	59 84		
Wages	41 65		
Inspection	705 10		
			18,952 50
GARRISON CREEK SEWER (N.W. BRANCH.)			
Ossington to Bloor.			
Land, damages and expenses	2,226 89		
Services T. Mitchell interviewing property owners	64 20		
J. Sharpe for modelling property	58 50		
C. R. W. Biggar, City Solicitor—Security for cost of appeal *re* Davis v. Toronto	400 00		
Carried forward	2,749 59		308,892 22

	$ c.	$ c.	$ c.
Brought forward	2,749 59		308,892 22
Analysis and report of water from creek	40 00		
Rubber boots	6 20		
Tape line	3 50		
Contract work—McKeown & Co	3,230 00		
Wages, Inspection	91 00		
			6,120 29
JARVIS STREET SEWER—RECONSTRUCTION.			
Lumber, 35,885 feet B. M	497 62		
Cedars, 12 feet	10 40		
Nails, 320 lbs	8 68		
Bricks, 93,000	734 70		
Cement, 130 barrels	364 00		
Sand, 134 yards	138 02		
9 and 15 inch pipe, 39 feet	7 50		
Manhole cover, 474 lbs	10 66		
White metal traps, 7	25 50		
Hauling cement, $14.40; repairing pump $4.50	18 90		
Tools, $2.65 ; rubber boots, $12.40	15 05		
Globes, oil, etc	3 60		
Rent of scow	30 00		
Water Works charges raising main	26 92		
Wages	2,770 16		
" Inspection	16 43		
			4,678 14
KING STREET SUBWAY.			
Land	1,000 00		
Contract work	28,314 21		
Gas Company's charges moving and relaying 12 and 16 inch mains	2,178 85		
Wages, bridge engineer and inspector	29 50		
" lighting subway	1 35		
Cement, 1 barrel, $2.80 ; bag salt, $1	3 80		
		31,527 71	
CR.			
Railway Companies charges, charged contractors		3,878 42	
			27,649 29
QUEEN STREET SUBWAY.			
Photographic views of subway	40 00		
Wages, Engineer's assistants	77 00		
" Counting vehicles	18 00		
			135 00
ROSEDALE CREEK SEWER.			
Contract work	8,665 00		
Bricks 28,000	224 00		
" paving, 2,400	63 60		
Carried forward	8,952 60		347,474 94

	$ c.	$ c.	$ c.
Brought forward	8,952 60		347,474 94
Cement, 114 barrels, $319.20 ; sand, 44 yards $48.96	368 16		
Lumber, 12,708 feet, $174.41 ; cedar blocks, $1.81	176 28		
Nails and spikes, $9.60 ; iron and oil, $8.25	17 85		
Iron and steel pipe	273 17		
Stone for sewer, cutting and carting	30 20		
Macadam	11 31		
Tools	2 35		
Medler & Arnot, material and labor Winchester Street sewer	116 47		
Wages	796 63		
" Inspection	232 21		
			10,977 23
SEWER EXTENSION TO WINDMILL LINE.			
Jarvis Street :			
Manhole cover 474 lbs	10 66		
Cement, 6 b'ls, $16.80; hauling cement $1.20	18 00		
Iron bars $1.64, oil 50c	2 14		
John Abell, 256 feet 6¼ inches steel pipe @ $6.99 $1,793 08			
Extras, castings and labor 73 58			
	1,866 66		
Medler & Arnot, mak'g bents and dr'g same	74 85		
Wages	373 19		
	2,345 50		
Berkeley Street :			
St. Lawrence foundry, 6-30 inch pipe, 14,520 lbs	283 14		
Medler & Arnot. 20 yards drain piling laying iron pipe @ $13.50	270 00		
			2,898 64
YONGE STREET SEWER, RECONSTRUCTION OF.			
G. T. R. charges, labor and material making track secure	146 42		
Smith & Co., boxing, screwing and fitting pipe	4 00		
			150 42
			361,501 23

SUMMARY GENERAL AND SPECIAL WORKS.	$ c.	$ c.	$ c.
Contract work and drawbacks on material d d 1890, private drains, etc	69,937 87		
Charges on account Local Improvement Works, made after By-laws passed	875 26		
Land and damages, rebates and claims for accidents	8,999 63		
Wages :			
General and special works	168,489 74		
Inspection ditto	6,581 58		
Engineers and assistants ditto	36,693 24		
Cutting posts, unloading and hauling posts, cement, etc	4,489 86		
Materials, etc., account lake currents	831 30		
" " Island groynes	35 52		
Lumber	12,630 10		
Cedar and tamarac posts	20,982 51		
Nails and spikes	1,228 86		
Bolts, washers, tie rods, screws, iron, paint, oil, globes, lanterns, coal, blacksmith's shop and sundry supplies	2,556 00		
Plant, repairs, tools, hose sharpening saws and picks	5,704 83		
Rubber boots, pants and jackets	276 30		
Engineering and office supplies, postage stamps, messenger service and sundry expenses	962 04		
Subscriptions to journals, engineering books, plans, maps and photos	783 19		
Bricks $3,010.51, cement $8,057.97 ; sand, gravel and loam $10,810.19, lime $9.20	21,887 87		
Macadam and cobble stone	7,235 38		
Stone crossings, stone for kerbs, gutters and crossings	3,502 78		
Scoria and granite setts	10,750 53		
Inverts, pipes, junctions, bends, etc	8,067 96		
Castings	3,801 49		
Iron and steel pipes	2,575 57		
Rent telephones and yards ; cost and rental of C.P.R. siding, Parkdale	1,670 68		
Engine hire and repairs 1890 and 1891	513 89		
Horse, harness, cutter, robe and rug	273 60		
Keep of 11 horses, cab hire, horse shoeing and repairs to buggies and wagons	3,122 65		
Advertising	1,501 20		
Water Works Department charges	1,389 94		
Special services interviewing property owners, surveys, searches, analysis of water and modelling Garrison Creek property	352 65		
Finch's wood preservative	10 00		
Stones for Sump, Bellmouth etc	117 30		
Gas Company's charge for laying mains, King street	2,178 85		
G.T.R. charges, labor on track Jarvis Street	146 42		
		411,155 99	
Carried forward		411,155 99	

	$ c.	$ c.	$ c.
Brought forward		411,155 99	
Cr.			
Charged:			
Local Improvement Works for private drains, cutting and hauling posts, etc., and engineering and expenses	19,247 85		
Contractors, Railway charges, ac't, King Street Subway	3,878 42		
Sundry persons, scrap iron, copperas, smoke tests, steel broom, etc	601 41		
Medical Health Dept., smoke tests, etc.	588 75		
Treasurer's Department, deposits for private drains and new walks	25,338 33		
		49,654 76	
			361,501 23
SUMMARY—LOCAL IMPROVEMENT PAVEMENTS.			
Contract work	296,709 84		
Interest allowed contractors on account Bloor and Scott Streets	386 66		
Cedar blocks	9,584 31		
" kerbing	1,068 12		
Lumber	2,651 89		
Cutting and hauling posts and use of tools	2,460 86		
Finch's Wood Preservative	130 00		
Granite and scoria setts	15,024 04		
Crossing and kerb stone	420 58		
Broken and unbroken stone	2,066 06		
Cement	6,663 89		
Bricks	578 08		
Gravel and sand	6,850 96		
Castings, manhole covers, tops and steps, culverts and traps	1,375 05		
Pipes, bends, junctions and slants	778 32		
Oil, nails, spikes, lamps, etc	643 59		
Lime	117 90		
Sodding	618 88		
Removing and transplanting trees	650 00		
Water Works Department charges	819 08		
Labor, work on pavements, culverts and drains	23,498 25		
Wages, inspection	4,296 15		
" Engineering and expenses (per centage)	6,324 22		
Private drains, Roxboro and Palmerston Av.	669 70		
	384,386 43		
Cr.			
Freight charges paid R'way Co.'s in 1890, and collected from contractors in 1891	375 21		
		.....	384,011 22
Charges on pavements completed prior to 1891 $87,458 86			
Charges on pavements completed and uncompleted 1891 296,552 36			
	384,011 22		
Carried forward			745,512 45

	$ c.	$ c.	$ c.
Brought forward			745,512 45
SUMMARY OF CHARGES LOCAL IMPROVEMENT SEWERS.			
Contract work	96,883 86		
Gas Co.'s charges, account relaying mains Yonge Street sewer	1,258 44		
Hire of sewer machine, Bay and Yonge Sts.	1,060 86		
Cement	6,933 20		
Sand and gravel	1,015 80		
Bricks	7,524 07		
Pipes, junctions, bends, etc	10,504 32		
Castings, traps, syphons, manholes, manhole covers, steps, grates, etc	2,966 47		
Lumber	1,322 01		
Cedar blocks (Davenport Road, etc)	640 30		
Sharpening picks, etc	180 61		
Oil, lamps, globes, coal, tools, etc	1,464 56		
Water Works Department charges	178 69		
Land, Steiner Street	100 00		
Wages :			
Inspection	4,837 00		
Work on sewers	40,631 92		
Engineering and expenses (per centage).	5,752 65		
	183,254 76		
Cr.			
Paid by Toronto University, account Hoskin Avenue and Devonshire Place sewers	3,778 34		
			179,476 42
Charges on sewers completed prior to 1891 $29,459 40			
Charges on sewers completed and uncompleted 1891 150,017 02			
	179,476 42		
LOCAL IMPROVEMENT SIDEWALKS.			
Wooden :			
Lumber, 3,376,256 feet B.M.	42,378 45		
Nails and spikes, 751½ kegs	2,055 47		
Cedar posts	145 25		
Lumber (miscellaneous)	237 43		
Cedar kerbing	141 53		
Stone "	600 87		
Gravel and sand $132.85; earth $99.60.	232 45		
Cement $64.40; bricks $37.14	101 54		
Pipe $17.85; castings $48.64	66 49		
Water Works Department charges	3,942 29		
Engineering, supervision and expenses (Per centage)	3,054 77		
Wages, labor on walks	11,348 59		
		64,305 13	
Carried forward		64,305 13	924,988 87

	$ c.	$ c.	$ c.
Brought forward	.....	64,305 13	924,988 87
Patent sidewalks :			
Contract work	53,997 45		
Cutting, moving and transplanting trees (College Street).....	212 50		
Lumber, King Street 70,491 feet B.M..	886 07		
Nails, King Street 18 kegs.....	42 84		
Gravel $27.35, cement $989.70	1,017 05		
Stone kerbing	174 47		
Cedar blocks.....	1 86		
Cinders $20; sundry supplies $14.17; use of tools $11.16.....	45 33		
Water Works Department charges....	1,813 85		
Labour, King Street walk, sodding Gerrard Street, etc	575 06		
Wages, Inspection	1,576 15		
Engineering and expenses (per centage.)	1,300 26		
		61,642 89	
			125,948 02
SUMMARY OF CHARGES—BRIDGES, EXTENSIONS, GRADINGS, ETC.			
Contract work	17,543 68		
Land, damages and expenses	80,689 65		
Railway charges, account Gerrard Street subway	720 76		
Cedar kerbing $146.17; and posts $56.70; (Huxley Street)	202 87		
Lumber	438 04		
Nails, oil, paint, brushes, ladder, etc	100 53		
Advertising $22.50 ; car tickets $5 ; cab hire $8.50	36 00		
Water Works Department charges	26 64		
Photo's, Dundas Street bridges	20 00		
Drain pipes.....	15 27		
Wages :			
Inspection	100 00		
Work Gladstone Avenue, etc	1,235 60		
Engineers and assistants	301 50		
Engineering and expenses (per centage).	140 78		
		101,571 32	
Cr.			
Victoria Street extension, manhole top charged 1890 not used.....	23 58		
Olive Avenue extension account, Engineering and expenses	100 00		
Sylvan Avenue grading, trees sold to S. B. Orson	12 00		
		135 58	
			101,435 74
Carried forward	.....	.....	1,152,372 63

	$ c.	$ c.	$ c.
Brought forward			1,152,372 63
SUMMARY DEPARTMENTAL AND PERSONAL ACCOUNTS.			
Contract work	701 15		
Railway charges (freight, etc)	2,138 37		
Claims for damages and costs	460 18		
Water Works charges	9 45		
Lumber	129 55		
Cedar blocks	8 93		
Castings	51 03		
Stone kerbing	3 92		
Pipes, junctions and bends	206 42		
Crossing stone $303.06 ; macadam $252.02	555 08		
Scoria setts $90 ; sand, gravel and loam $103.44	193 44		
Bricks $52.26 ; cement $919.73	971 99		
Smoke testing machine $132.60 ; smoke tests $601.75	734 35		
Flushing sewers $24 ; sidewalk corner Church and Carlton Streets $118.80	142 80		
Wagons and sprinklers $349.32 ; steel broom $37.46	386 78		
Hire of sweeper and repairs $112.10 ; hauling cement $2.70	114 80		
Sharpening picks $5.28 ; blue prints $7	12 28		
Scrap iron and copperas	196 55		
Paint, brushes, washers, oil, nails, etc	17 37		
Cab hire, $26.75 ; type writing $12	38 75		
Sale of trees, Sylvan Avenue	12 00		
Deposits for new walks	1,116 43		
" private drains $25,493 45			
Less refund orders 813 42			
	24,680 03		
Wages :			
Inspection	1,455 64		
Engineering and assistants	915 40		
Labor	2,121 88		
Paid by University, account Devonshire Place and Hoskin Avenue sewers	3,778 34		
Paving Medical College yard	20 00		
Sale of logs from Hoskin Avenue	6 00		
			41,178 91
Amount paid into treasury (net) . 36,533 02			
Charged Treasurer, account level crossings $15 00			
Ditto, Esplanade 15 00			
Ditto, Street Railway acquisition 745 65			
775 65			
	37,308 67		
Outstanding accounts 31 12 91	3,870 24		
	41,178 91		
Total			1,193,551 54

GENERAL SUMMARY.	$ c.	$ c.	$ c.
Contract work, drawbacks and interest	537,035 77		
Water Works charges	8,203 94		
Gas Company's charges repairing mains	3,437 29		
Moving and transplanting trees	862 50		
Railway charges (freight, etc.)	2,630 34		
Paid for sodding	618 88		
" special services, searches, interviewing property owners, etc	364 65		
Land damages, rebates and claims for accidents	90,249 46		
Wages :			
Work on Local Improvement pavements, sewers, sidewalks, private drains and general and special works	247,951 04		
Inspection, ditto	18,656 52		
Engineers and assistants, ditto	37,910 14		
Cutting posts, unloading and hauling posts, cement, etc	4,947 95		
Lumber	62,029 36		
Finch's Wood Preservative	140 00		
Cedar and tamarac posts	31,419 86		
Nails and spikes	3,327 17		
Bricks, cement, sand, loam, gravel, earth and lime	53,998 24		
Macadam and cobble stone	9,553 46		
Granite and scoria setts	25,864 57		
Stone crossings, kerb and gutter stone	5,059 18		
Inverts, pipes, junctions, bends, etc	19,590 14		
Iron and steel pipes	2,575 57		
Castings	8,215 10		
Stone for bellmouth, sump, etc	117 30		
Plant, tools, hose and repairs	6,386 24		
Bolts, washers, tie rods, iron, paint, oil, lanterns, globes, rubber suits and sundry supplies	5,090 08		
Rents telephones, and yards, rental and cost Parkdale siding, hire of engine and sewer machine	3,245 43		
Engineering and office supplies, postage stamps, messenger services and sundry expenses	962 04		
Subscriptions to journals, engineering books, plans, maps and photos	803 19		
Keep of 11 horses, cab hire, horseshoeing and repairs to buggies and wagons	3,162 90		
Horse, harness, cutter, robe and rug	273 00		
Advertising	1,523 70		
Material, etc., account Lake currents	831 30		
" " Island groynes	35 52		
Private drain deposits refunded prior to March, 1891 (paid by vouchers)	458 13		
		.....	1,197,529 96
Cr.			
Railway charges account, King Street subway, collected from contractors	3,878 42		
Engineering and exp'ns's, acc. Olive Av. ext'n	100 00		
		.....	3,978 42
			1,193,551 54

VOUCHERS CERTIFIED FOR PAYMENT, 1891.

Abell, J	$2,086 83
Adamson, E	408 51
Adamson, Joseph	112 65
Agnew, John	100 20
Aikenhead & Cromblie	50
Aitkin, R. J	28 14
Alexander & Son	37 70
American Rattan Co	729 38
Anderson, W	263 00
Ardagh & Leonard	864 00
Armstrong, John	5 45
Armstrong, S	110 49
Armstrong, J. D	70 00
Ayre, J	10 00
Aykroyd Bros	6 25
Baines, C. C	25 00
Baker, J. B	11 14
Banfield, W. H	74 61
Barton, K. W	9 50
Barclay, Clarke & Co	313 00
Barrett, R. G	10 00
Bateman, J	3 72
Baird, John	108 70
Beatty, S	40 00
Beatty, T	2,980 37
Bedford, J	10 00
Bengough, Geo	167 77
Bell Telephone Co	121 15
Berry, W	10 00
Bertram & Co	151 12
Bickford Estate	920 00
Biggar, C. R. W	526 00
Blackburn & Co	4 00
Boatman, Chas	44 36
Boddy, S. J	230 40
Boeckh & Son	432 92
Bond, R	6 00
Booth, J. J	7,625 23
Booth, W	927 50
Booth & Son	81 50
Booth, R. J	4 00
Bostwick, G. F	9 45
Boulton, M	20 00
Boxall, J	4 00
Broadfoot & McFadden	6 00
Brodigan & Co., J	10 12
Brown, Jos	56 00
Brown, H. and W. A	33 00
Brown, Chas	101 72
Brown, A. J	42,206 59
Brown, W	44 70
Bunker, Geo	8 25
Buckner, R. E. H	510 00
Butcher, N. R	6 00
Butler, E. W. D	$30 00
Burns, E	87 50
Burns & McCormack	20,392 12
Bryce Bros	461 83
Callaghan, H	719 48
Cannift, C. M	4 85
Callaghan & Gibson	3,093 00
Canadian Contract & Record	54 00
Campbell, Charles	15 00
Canadian Electrical News	1 00
Canadian Express Co	1 50
Canadian Pacific Ry. Co	714 95
Canadian Architect and Builder	200 50
Canadian Rubber Co	212 40
Carey, R	43 00
Case, G. A	20 00
Cathro, W. H	45,239 09
Castor J	36 45
Catto & Co., John	24 90
Cavan, J. C	37 50
Cawthra, John	29,637 18
Cawthra, Jos	153 40
Cawthra, H	15,477 04
Cayley, F	56 00
Central Bridge Works	124 00
Champion & Berthon	82 50
Chapman, A	83 49
Charles, J. S	400 00
Checkley, E. J	70 01
Chewitt, J. C	5 00
Christie Lime and Stone Co	122 40
Clarey, James	168 20
Clarke & Connolly	967 63
Clarke & Co	5,350 85
Clarke, C. H	16,406 02
Close, T. G	20 00
Collett, Charles	42 65
Coates & Co	5 75
Coatsworth, E. J	871 00
Coleman & Co., H	102 60
Conger Coal Co	48 00
Consumers Gas Co	3,494 09
Conboy, James	10 00
Constructing and Paving Co. Limited	88,166 36
Cooper, C. J	32 25
Cook & Bunker	5 00
Cook, S	383 09
Copp Clark & Co	228 05
Copp, W. W	75 90
Cozens, J. G	9 26
Crawford, E. A	100 00
Crawford, W	3,200 00

VOUCHERS—(*Continued.*)

Crow, T.	86 77
Cuff, J. T	1,952 10
Cunningham, G. C.	59 00
Customs Planing Mill	124 30
Cyclostyle Co	11 00
Daniels, D.	3 00
Daniels & Co., C. D.	14 60
Darling, H. W.	20 00
Davidson, W.	5 00
Davidson, J. L	10 00
Davidson & Hammill	2,632 92
Davies, R	15 00
Deegan, Robert	24 00
Defoe, D. M.	195 00
Denison, H. L	123 90
Denison, F. C. and H. B.	326 45
Denison, G. T.	380 86
Denison, A. R.	29 00
Denison & King	16 00
Dominion Bridge Co.	14,065 57
Donohue, M.	103 20
Dominion Transport Co.	1 50
Donaldson, W. F.	19,287 82
Dowd, P	20 00
Dow, A. R.	2 00
Downey, Alex	68 60
Duckworth Bros	3 20
Duffy, James	528 00
Electric Despatch Co	25
Ellis, M. J.	49 60
Ellis, W. H	40 00
Elliott & Co. Estate, W. H.	11 63
Empire Oil Co	156 21
Empire Printing Co	216 75
Engineering Review	3 29
Engineer'g and Buil'g Record	28 00
Engin'g News Publish'g Co.	20 20
Evans, George	88 10
Evans, A.	10 50
Evans, John	6 55
Excelsior Paving Co.	9,942 81
Fanning, W.	356 54
Farquhar, G.	70 00
Farquhar, C.	2,538 95
Farquhar, E. and C.	5,690 10
Farley, J	14,418 26
Field, M. G.	7 00
Feigehan, J	11 10
Fiddes & Hogarth	33 75
Finch Wood Preservative Co	140 00
Findlay, J.	75
Fleming, A. & R.	28 50
Fleming, R. J.	487 80
Fleming, James (Estate)	10 59
Flavell, Agnes	$125 00
Fletcher & Son	65 64
Flint, S.	20 00
Forney, M. N.	3 00
Forbes, D. C	207 60
Forsyth, R	17,154 20
Foster, Jas	85 60
Fortier & Small	5 00
Fraser, J	2,272 20
Freeman & Watson	862 50
Fry, R	42 41
Gardner & Co., A	18,837 99
Garnet, W	21 20
Gibson, B	15,642 02
Gilchrist, D	19 00
Glass & Co	75
Globe Printing Co	197 25
Goddard & Barnard	1 30
Godson, A W	51,045 67
Goad, Chas	109 00
Good, Jas.	860 00
Goldring, J	125 90
Goldring, R	1,892 60
Goldring, E.	1,380 56
Gosnell Bros.	20 00
Graham, G.	1 50
Grand & Co	84 50
Grand & Toy.	18 60
Grand Trunk Ry. Co.	3,457 72
Grantham C. H.	1,130 07
Grant, John	61 88
Grant, R	9,896 31
Grant, Hugh T.	111 40
Gray, R	50 00
G. N. W. Telegraph Co.	12 86
Greenwood, Geo	4 50
Greening Wire Co., The B.	200 00
Grey, W. & J. G	3 51
Gripton, C.	9 00
Gutta Percha aud Rubber Manufacturing Co.	3 24
Hale & Co., W. T.	3 25
Hall & Son W.	80 50
Hamilton Bridge & Tool Co.	8,884 04
Hamilton & Toronto Sewer Pipe Co	12,053 49
Harryatt, W.	40 25
Harrison, Glover (Estate)	1 13
Harris & Duncan	1,878 13
Harris & Co., E.	81 51
Hasler, M. H.	178 92
Hayes, E. G.	36 85
Head, W	750 15
Henderson, J. D.	200 00

VOUCHERS—(*Continued*).

Henderson, J. W	$270	00	
Henderson, John	107	75	
Henderson, A. J	71	33	
Henry, David	8	40	
Henshaw, W	3	91	
Hensel & Clarke	6	53	
Henley & Co., N. W	1	00	
Hewitson, John	8	79	
Hewlett, Jas	15	00	
Hickson & Thompson	100	00	
Hickey, John	2	50	
Hicks T. L	47	55	
Hill, R. H	1,041	15	
Hilts, Jas	1,433	42	
Hime, & Co., H. L	477	00	
Hiron, E	3	30	
Hodgson, Thos	30	50	
Hogg, W	94	79	
Holmes, J	294	40	
Hope, W	25	00	
Hubbard, W. P. and A. M	442	00	
Humphrey, E	34	00	
Hutchinson & Son	17	80	
Ibbottson, B	2	10	
Inglis & Son, John	36	00	
Innis, P. L	40	00	
Island Park Ferry Co	476	25	
Jackes, Joseph	630	35	
Jackson, J. H	140	00	
Jackman & Co	25	00	
James, Silas	10	00	
Janes, W. D	869	40	
Janes, J. S	182	16	
Jeffery & Son	29	66	
Jenkins, Thos	20	00	
Johnston, Robert	7	00	
Johnston, P. A	447	35	
Jones, W	3,836	71	
Jones, John	2	40	
Kane, Thomas	174	82	
Keenear, Robert	20	90	
Kendrick, Josiah	593	00	
Keighly, F	277	00	
Kennedy, Thomas	15	00	
Kiely, W. T	44,846	10	
Kiely, W	1,444	23	
Kiely, Mod	22	00	
Kilgour Bros	5	75	
Kirkpatrick, L. J	282	00	
Kirkpatrick & Son, W. A	25	60	
Knowlton, A. S	658	66	
Knowlton, W. H	11,342	41	
Lamb, W. G. A	122	50	
Land Security Co	1,226	00	
Langley & Burke	$4	35	
Latham, George	122	71	
Lawless, Thomas	4	40	
Leadley, E	15	00	
Leak & Co	42,633	96	
LeBar, W	42	96	
Leckie, John	33	60	
Lewis, Rice & Son	30	60	
Lee & Son, W. A	30	00	
Lee, W. G	266	50	
Leroy, J. B	20	00	
Livingston & Wright	25	50	
Lough, M	39	45	
Lugsdin & Barnett	5	30	
Lyman Bros	9	55	
MacMath, H	154	60	
McLennan, Stuart & Co	17	50	
MacDonell, A. L	134	32	
Mackerow, J. A	7	00	
Magann, G. T	6	27	
Maguire, W	4,017	70	
Maddock, John	7	20	
Mahaffy & Son, W	381	94	
Mail Printing Co	120	20	
Malcolm, W. B	43	70	
Mallon, J. J	30	00	
Mann, H	5	00	
Mara, H. S	65	00	
Map and School Supply Co.	44	15	
Markets and Licenses Com.	530	00	
Martin & Son, G. and T.	72	00	
Marsden, Joseph	64	75	
Marks, John	129	16	
Martin, —	35	82	
Mason, W	17	15	
Massey, John	25	00	
Matthews, J. T	372	39	
Matthews, John	927	43	
Maunder, Jas	13	25	
McArthur, J	1,143	13	
McArthur, A., jr	29	92	
McBride, R. J	19	75	
McBean, W	400	00	
McBean, John	10,657	92	
McCarthy, Osler & Hoskin	620	00	
McCourt, W	743	90	
McCabe, W	10	00	
McDougall, Alan	215	00	
McDougall, J. E	65	00	
McDonald, R	2,366	57	
McIndoo, Jos	7	50	
McKnight, J. H	17,651	93	
McKeown & Co., F	8,488	69	
McKeown & Challis	7,438	18	

VOUCHERS—(*Continued*).

McKee, R.	$40 38
McLeish, W.	10 00
McMahon, M.	2 50
McNally & Co.	6,923 28
McRae & Co.	20,376 87
Medler & Arnot.	2,687 28
Meredith & Co., T.	401 81
Mitchell, John.	291 90
Micklethwaite, F. W.	60 00
Mitchell, Thomas.	180 40
Morrison, W. H.	4 06
Montgomery, Wood & Co.	102 50
Morrison, James.	6 60
Morrow, A.	5 50
Mowatt, H. M.	128 55
Morson, F. M.	151 00
Murray, Thomas.	518 30
Murray, M.	4 21
Munshaw, W.	15 56
Mutart, J. C.	4 71
Nelson, C. H.	20 00
Newman Bros.	2,913 73
News Printing Co.	276 25
North of Scotland Canadian Mortgage Co.	50 00
O'Brien, M.	792 60
O'Connor, H. J.	56 25
O'Connor, T.	111 10
Ontario Industrial Loan & Investment Co.	374 00
Osler, E. B.	777 57
Owen Sound Stone Quarrying Co.	1,106 82
Pardee, A.	1,840 86
Parker, S.	203 50
Passmore, F. F.	30 50
Patent Office of Canada.	4 50
Patterson & Booth.	1,939 50
Pay Rolls.	314,065 25
Petty Cash Vouchers.	40 00
Pearsall, G.	19 05
Pearson, J. F.	82 50
Pearson, James.	958 50
Pearce & Co., C. F.	5 75
Pendrith, J. H.	5 87
Petrie, A.	10 00
Peuchen & Co., A. G.	10 00
Phillips, J. W.	2,728 51
Pinder, Joseph.	1 55
Piper & Sons, N. L.	33 70
Plowman, S. E.	95
Pollock, M.	8,752 85
Polson Iron Works Co.	1,443 07
Potter, Charles.	83 90
Preston, J.	$20 00
Proctor, J. W.	10 00
Proctor, S. J.	135 00
Railroad and Engineering Record.	3 00
Rama Lime Stone Co.	244 41
Rathbun Co.	4,594 04
Ramsay, J. G.	10 00
Randall, C. R.	7 00
Read, D. B.	264 60
Reid, W. C.	1,172 43
Reid & Co.	15,728 29
Registrar of West Toronto.	8 30
Rennie, D.	83 11
Reynolds, W.	60 00
Ritchie, John.	7 90
Ritchie, Leaming & Co.	1,000 00
Ridout, D. C.	10 00
Robertson & Co., Joseph.	28 80
Robertson, J. Ross.	225 50
Roberts, E. H.	26 05
Robertson, L. H.	60 00
Rogers, James.	2,897 86
Rogers & Co., Elias.	116 24
Rolling, W. T.	120 00
Rose Cartage Co.	38 25
Rosenburg, M.	75 00
Ross & Co., W. R.	93 95
Rust, C. H.	87 25
Ryan, C.	40 00
Sanderson, Pearcy & Co.	6 65
Salmon & Watson.	1 45
Scott, W.	75 00
Scott & Cross.	85
Scoria Paving Block Co.	3,139 30
Scully, J. and T.	68 00
Shields, C.	215 50
Shannon, A. & Co.	3,470 29
Shedden Co.	45
Shirlock, R.	11 85
Shewan, M.	270 00
Sheppard, J.	135 50
Sharpe, John.	58 50
Sheppard, S. T.	18 00
Slater, J. T.	18 59
Small, John.	420 00
Smallpiece, W. S.	358 69
Smith, F. J. & Co.	30 00
Smith, Andrew.	2 00
Smith, E. A.	757 74
Smith & Son, J. B.	667 37
Smith, H. F.	38 88
Smith, R.	12 00
Smith Bros.	37 50

VOUCHERS—(*Continued*).

Snider & Co., R. O	$5 80
Sproatt, C.	185 00
Spaight Wagon Co.	201 22
Spry, W.	470 00
Stanbury, James	23 59
Stark, John	25 00
Stewart, E. J.	25 00
Standard Foundry Co.	78 00
Strader, John	11 40
Sturgeon, T.	9 50
Staines, Henry	3 50
Strange, G. W.	268 50
St. Lawrence Foundry Co.	485 65
St. Simon's Church Trustees	57 51
Stokes, John T.	10 00
Stinson, J. W.	6 25
Strathy, (Estate Dr.)	10 35
Stevenson, Frank	52 27
Sullivan, J. P.	2 00
Taber Bros.	12,301 56
Taylor, J. & J.	236 65
Taylor & Wheeler	450 00
Tennant, James	280 00
Teevin, John	11 51
Terry, E.	2 80
Teskey, L. M.	11 34
Thompson, J. E.	25 00
Thompson, J. L.	20 00
Thompson, Robert	2 25
Thomas, M.	197 72
Thomas A.	201 74
Thorne, Horace	15 60
Thompson Bros.	14 50
Thompson, O.	15 00
Tilney, W.	37 50
Tingley & Stewart	21 25
Todd, R. M.	3 50
Toy, B. B.	85 00
Toronto Coffee House Association Co.	7 80
Toronto Electric Light Co.	55 92
Toronto Post Office	2 34
Toronto General Trusts Co.	938 90
Townsend, J.	4 00
Toronto Lead & Color Co.	109 13
Townsend, S. H.	75 00
Tomlinson & Son	7,745 28
Toronto Street Railway Co.	486 00
Toronto Rubber Co.	312 48
Treble, J. M.	$9 58
Turner, N. L.	1 00
Turnbull, M. A.	334 18
Tymon, A. J.	180 00
Usher, J. F.	8 25
Unitt, F. W.	6,652 55
Underwood, J.	23 15
Unwin, Foster & Proudfoot.	23 00
Van Vlack, D. L.	45,334 65
Victoria Stained Glass Co.	9 00
Vokes, Malcolm Stone Co.	3 00
Warren Scharf Asphalt Paving Co.	32,743 15
Walker, Thomas	27 63
Water Works Department.	8,163 96
Waldie, John	765 00
Walker, T. W.	3 09
Warnock & Co., James	78 91
Wagstaff, D. R.	43 00
Walker, George	139 25
Wagstaff, D	2,595 94
Watt & Fogg	74 90
Wakefield, M.	4,379 22
Waterous Engine Works Co.	64 13
Ward, W.	5 28
West, R.	11,528 48
Weller, H.	4 18
Westman, E.	3 50
Whiteside, T. R.	9 25
Whitfield, John	310 09
Whitney, J. W. G.	50 00
White, James F.	426 31
White, W.	18 47
Wheeler & Bain	198 90
Whitney & Son	50 00
Williams, R. S.	16 59
Withrow & Hillock	26 98
Williams, H.	20 00
Williamson & Co.	58 00
Williams, F. H.	587 66
Wilson, P.	790 80
Williams, J.	5 00
Williams, H. H.	81 30
World Printing Co.	159 75
Wright S.	8 00
Young, L. B.	125 50
	$1,246,638 73

PAVEMENTS.

Street.	From	To	Dr.
			$ c.
Adelaide	York	Spadina	114 25
Abbs	Brock	West terminus	677 73
Bay	Esplanade	Front	5,479 77
Booth	Queen	Eastern	2,350 31
Broadview	Queen	"	2,876 93
Bismarck Av	Gwynne	East terminus	1,286 72
Bay	King	Queen	17,853 82
Bismarck	Yonge	Gwynne	1,341 70
Brown	Brock	West terminus	745 95
College, s.s	Augusta	Markham	3,378 08
Cawthra Sq	Jarvis St. West	Around Square	1,283 44
Christie	Bloor	Melville	6,366 74
Claremont	Queen	Robinson	225 28
Clinton	473 ft. south of Bloor.	871 ft. south of Bloor	1,098 49
Dovercourt	Bloor	Union	15,107 13
Dufferin	Bloor	"	17,547 44
Dundas	Queen	The bend	166 64
"	Bruce	144 ft. south	77 52
Douro	Bathurst	East terminus	834 51
Dupont	Manning	Bathurst	936 99
Delaware Av	Bloor	Van Horne	7,607 32
Darling Av	North terminus of St.	South terminus of sewer.	625 93
Duncan or Wright	Macdonnell	Sorauren	1,992 22
East Av	First Av	South Av	1,775 12
Grafton Av	Roncesvalles	East terminus	1,887 02
Grace	Arthur	College	2,089 30
Givens	College	Bloor	2,287 75
Gerrard	Jarvis	Sherbourne	13,127 25
Gordon	Dufferin	Sheridan	1,417 83
Hamburg	Bloor	Union	16,439 38
Howard Park Av	Dundas	Roncesvalles	2,200 11
Harris	Queen	Paul	1,459 25
Henderson	Clinton	Grace	1,081 50
Jordan	Wellington	King	3,282 25
King	Dufferin	3,000 ft. east	25,557 43
"	From Strachan Av		4,277 56
Kensington Cres	Huntley	Park Rd	1,282 99
Leslie	Queen	Bay	3,192 83
Lane between Borden and Lippincott	Ulster	Harbord	1,313 87
McKenzie	Bloor	O. and Q. Railway	6,650 14
McPherson	Rathnally	Poplar Plains Rd	3,285 49
Massey	King	Queen	3,194 48
Melinda	Yonge	Bay	8,594 34
Marion	Macdonnell	Lansdowne	810 65
Napier	Munroe	Lane east of Davies	806 29
Phoebe	Spadina	Soho	5,168 91
Queen St raising	Garrison Creek	Bellwoods	8,783 16
Rosedale Rd	Roxboro'	North Drive	957 22
Rossin House Lane	York	East terminus	787 08
Spadina, w. s	Nassau	Clyde	542 00

PAVEMENTS—(*Continued*).

Street.	From	To	Dr.
			$ c.
Spadina Rd	Bernard	C.P.R	4,299 46
Shaw	Queen	Defoe	2,019 99
Shirley	Brock	Lansdowne	2,249 41
Spadina Av., w. s.	Nassau	Oxford	724 63
Sherbourne	South Drive	Bridge	15,071 42
St. George	College	Bloor	33,738 63
Sully	Terminus	College	1,132 26
Tranby	Bedford Rd	157 ft. east	484 85
Toronto	North end of Setts.	Adelaide	31 00
Vermont	Bathurst	Manning	2,822 40
Victoria	King	Adelaide	131 50
Wascana Av	Sumach	140 ft. east	587 75
Wellington	Bay	York	12,915 47
Woodlawn Av	Yonge	West end	4,585 28
Walmer Rd	Castle Av	Bernard	2,545 97
Walter	Davenport	McMurrich	986 23
			296,552 36
COMPLETED PRIOR TO	1891		
Avenue Rd	Davenport	North city limit	1,388 40
Alice	Yonge	Terauley	146 50
Bloor	Yonge	Sherbourne	10,945 33
Bloor	Shaw	Clinton	12,296 61
Brunswick Pl	Walmer	Brunswick Av	152 65
Bloor	Yonge	Avenue Rd	2,620 59
"	Bathurst	Clinton	1,378 06
"	Shaw	Dufferin	1 50
"	Avenue Rd	Bathurst	2,272 20
Brighton Av	Pape	East terminus	44 54
Bridge	Bloor	Elm Av	145 18
Bathurst	Bloor	South limit C.P.R	2,299 30
Birch Av	Yonge	West end	530 69
Bedford Rd	Bloor	Lowther	219 00
Booth Av	Queen	G.T.R	275 47
Bernard	Bedford	St. George	101 15
Brownsville Lane	St. Joseph	St. Albans	45 30
Barton Av	Manning	Euclid	79 40
Brunswick Av	College	108 ft. North	393 83
Bloor	Shaw	Dufferin	2,637 30
Crocker	Bellwoods	Claremont	861 16
College	Spadina	Robert	518 33
"	Ossington	Dufferin	2,617 33
Cowan	King	G. T. R	443 88
Crawford	Queen	Defoe	209 97
College	Spadina	Augusta	119 15
Carlaw	Queen	Eastern Av	103 56
Callender	Queen	North terminus	220 93
Dunbar Rd	Elm	Hill	163 07
Dupont	Avenue Rd	Bedford	2,368 12
Davenport Rd	Avenue Rd	Hazleton	114 00

PAVEMENTS—(*Continued*).

Street.	From	To	Dr.
			$ c.
Defoe	Tecumseth	Niagara	312 87
Dovercourt Rd	Queen	Blair	74 26
Dale Av	McKenzie	Glen Road	169 70
Dewson	Ossington	Dovercourt	500 46
Euclid Av	Bloor	Ulster	235 80
Eastern Av	Trinity	Water	414 19
Elmsley	Brock	Maud	106 00
Euclid Av	Bloor	Johnston	510 33
Elmsley Pl.	St. Joseph	North terminus	121 03
Frizzel Av	Carlaw	Pape	1,637 02
Frankish Av	Sheridan	Brock	116 40
Grant	Queen	North terminus	311 56
Gordon Av	Dale	Elm	226 62
Hayden	Yonge	Church	251 36
Howland Av	Wells	C.P.R	493 69
Hayden	Church	East terminus	196 57
Huron	Bloor	Bernard	562 90
"	Bernard	Dupont	232 60
Howland Av	Bloor	Wells	266 13
Hamilton	Paul	Elliott	91 94
Harbord	Markham	Bathurst	41 70
John	Queen	King	533 80
Lowther Av	St. George	Walmer	388 67
Lorne	Front	Esplanade	167 00
Lane off Foxley			11 75
Lane south of Queen	Simcoe	Duncan	76 08
Lobb	Shaw	Crawford	126 29
Morris	Spadina	Huron	128 84
Manning Av	Bloor	Hammond Place	661 25
Millstone Lane	York	East terminus	81 46
McMaster	Avenue Rd	Rathnally	174 70
Mitchell Av	Tecumseth	Niagara	112 63
Madison Av	Bloor	Dupont	397 50
Marlborough	Yonge	West end	168 00
Montague	Queen	Harvard	122 00
McKenzie Cres	Lisgar	Beaconsfield	74 26
New	Davenport	West end	17 50
Palmerston Av	Bloor	Union	2,043 30
Prospect	Rose Av	Ontario	345 72
Prince Arthur	Present terminus	Huron	348 10
Piper	York	East terminus	440 50
Peter	King	Queen	450 14
Roncesvalles	Present terminus	Dundas	1,886 05
Roxborough	Yonge	2,100 ft. east	5,315 49
Rusholme Rd	College	Bloor	740 50
Rathnally Av	McPherson	Rathnally Cres	313 00
Renfrew Pl	McCaul	East terminus	27 00
Ruth	Sorauren	McDonald	218 00
Russell	Robert	Spadina	22 00
Rush Lane	Esther	Portland	88 72
Roncesvalles	Queen	N. Limit Parkdale	4,889 22
Scott	Front	Colborne	1,850 17

PAVEMENTS—(*Continued*).

Street.	From	To		Dr.	
				$	c.
Spencer	Huxley	Mississauga		132	53
Spadina, w. s.	College	Spadina Cres.		185	54
St. Clarence Av.	Dundas	Bloor		950	64
Sumach	King	Eastern Av.		119	50
Sully Cres	Sully	Shaw		86	05
Spadina Av	Cecil	Baldwin		307	97
Shaftesbury Av	Yonge	1,100 ft. east		316	70
Salisbury	West present limit	190 ft. west		44	90
Simcoe	King	Queen		1,746	84
Smith	Broadview	Logan		467	24
St. George	Bernard	Dupont		1,357	02
Sorauren Av	Old Bound'y Parkdale	Dundas		194	34
Sherbourne	Queen	Bloor		5,417	34
Soho	"	Phoebe		202	00
Sully	Arthur	1,465 ft. north		207	45
Spadina Rd	Bloor	Bernard		540	50
Simpson Av	Broadview	East terminus		445	00
Sydenham Lane	Sydenham	South end		189	07
Stafford	King	Wellington		171	95
Tranby	Avenue	West end		87	45
Thompson	Davies	Munroe		127	00
Victoria St. Lane	Queen	Shuter		127	68
Virtue	Sorauren	East terminus		73	96
Westmoreland	Bloor	Durham		351	77
"	Durham	Union		546	22
				88,890	90
	Cr.				
Bathurst	Queen	College	12 50		
College	Major	Borden	207 54		
Dundas	Sorauren	Bloor	6 50		
Grange Av	Beverley	McCaul	8 50		
Logan	Gerrard	Danforth	5 00		
MacPherson Av	Avenue Rd	Rathnally	1,172 00		
Nelson	Simcoe	John	20 00		
				1,432	04
				87,458	86
		Total		384,011	22

SEWERS.

Street.	From	To	Dr.
			$ c.
Armour, Blair & Lisgar			16,167 08
Addison Av.	Perth Av	200 ft. west	417 38
Atlantic Av.	King	Exhibition Grounds	2,821 75
Brock Av	Bloor	North end	2,178 80
Battye	Broadview	Bowden	1,059 15
Barton Av	Bathurst	Euclid	1,697 02
Birtle Av.	Jones	Brooklin	853 93
Bloor	Dufferin	Dundas	1,114 58
Centre Rd	Roxborough	North Drive	417 15
Carlaw Av	Queen	Danforth	10,915 30
Davenport Rd.	Yonge	Hazleton	12,155 86
Dupont	Manning	Christie	1,186 12
Devonshire Pl.	Hoskin	Bloor	102 67
Dovercourt Rd.	Blair	200 ft. North	362 17
Elm	Elizabeth	Chestnut	456 79
Essex	Christie	Westerley	1,080 77
Edward	Chestnut	University	860 50
Elm	Glen	Gordon	1,678 25
Edwin	Royce	Ruskin	1,997 67
Earnbridge	Terminus of sewer	C.P.R	169 44
Edmund	Royce	O. & Q. Railway	1,213 58
Edwin	Royce	C.P.R	1,319 00
Fraser Av	King	South terminus	3,394 57
Franklin Av.	Irving	O. & Q. Railway	2,663 93
Garnett Av	Christie	Terminus	1,187 24
Gorevale Av	700 ft. s. of Bloor	South limit	2,240 33
Gerrard	Broadview	Don River	1,863 32
Hoskin Av	198 ft. E. St. George.	University Creek	152 95
Irving Av	Franklin	Perth	1,245 83
Liberty	Fraser	Jefferson	4,207 86
Lane East.	Balmuto	137 ft. east	401 53
Lane bet. King & Pearl	Simcoe	York	702 85
Lane " Yonge & James	Albert	Louisa	437 76
Lynd Av	Dundas	College	1,883 97
Lane off Dufferin	Alma	Waterloo	266 83
Lane east of Spadina.	Grange	St. Patrick.	16 80
Melady's Lane	Sydenham	St. David's	583 30
Muir	Sheridan	140 ft. west	283 83
North Drive	Rosedale Rd	Terminus	464 24
"	"	Yonge	2,362 12
Noble	Terminus of sewer	C.P.R	1,139 87
Perth Av	Bloor	C.P.R	11,653 66
Pardee	Liberty	South terminus	1,885 15
Powell	Dale	Maple	542 79
Queen	Yonge	Elizabeth	7,138 41
"	Beverley	Peter	1,315 18
Royce Av	Perth	Symington	778 87
Radcliffe Av	Queen	Eastern Av	1,543 23
Rosedale Rd	Roxborough	North Drive	156 01
Ruskin Av	Edwin	Perth	2,099 86
Royce Av.	"	T. G. & B. Railway	412 83

SEWERS—*Continued*.

Street.	From	To	Dr.
			$ c.
Regent Av	Regent	Blair	396 76
Royce Av	Perth	Edwin	1,724 89
Sheridan Av	Banks	350 ft. north	793 95
Symington Av	Earnest	C.P.R.	7,570 95
Steiner	Matilda	Don	1,056 14
Stephanie Pl	John	Beverley	605 05
Sheridan	Present terminus	Dundas	1,621 28
Strickland Pl	Noble	Earnbridge	412 34
Springhurst	Cowan	Jamieson	1,194 79
Trinity Sq	North side		703 43
Walker's Lane	50 ft. north of Duchess	Queen	409 88
Wellesley Pl	Wellesley	Wellesley Lane	803 59
Yonge	Ann	St. Albans	18,172 56
Yarmouth	Christie	Manning	1,201 33
			150,017 02
COMPLETED PRIOR TO 1891 :			
Arlington	Terminus	Walmer	5 27
Bay	King	Queen	2,624 70
Bellevue Sq	Present terminus	132 ft. east	41 76
Bartlett	Bloor	Union	329 00
Brunswick Av	"	Wells	600 00
Brooke Av	Logan	Howland	100 00
Crescent Rd	North Drive	South Drive	51 29
Curzon	Queen	Sproat Av	558 07
Christie	Terminus of sewer	North City Limit	410 78
Clement Av	Roncesvalles	Sorauren	195 42
Cuttle's Lane	Elizabeth	East terminus	53 91
Clifford	Strachan Av	East end	53 00
Cypress Av	Logan	Broadview	165 00
Colbourne (now Barton Av)	Manning	Euclid	73 00
Duchess	Sherbourne	Ontario	10 28
Dundas	Bloor	Conduit	770 04
Drummond Pl	Adelaide	North terminus	8 09
Davies	Queen	Matilda	116 50
Davenport Rd	Avenue	Hazleton	142 00
Defries	Radenhurst	Blevins	43 20
Englewood Av	Pape	East end	72 16
Elm	Centre	Chestnut	40 00
Eastern Av	Water	Don	84 16
Front	Don	400 ft. east of Cherry	574 60
"	Berkeley	Trinity	113 50
"	Yonge	Bay	203 00
Givens	Arthur	College	345 75
Howard	Sherbourne	Bleeker	175 24
Howard Park	Dundas	Roncesvalles	973 93
Herrick	Borden	Lippincott	231 35

SEWERS—(*Continued*).

Street.	From	To	Dr.
			$ c.
Havelock	Bloor	Creek	245 75
Hallam	Dovercourt	Dufferin	356 00
Howie Av	Clarke	North end	43 00
Jefferson	King	South terminus	1,940 49
Jones Av	Queen	Danforth	2,835 76
Jemima	Logan	Railway tracks	8 31
Jordan	King	Wellington	34 26
King	Garrison Creek	Dufferin	42 59
Kensington Cres	Park Rd	Bridge	2 06
Lappin Av	Dufferin	G. T. Railway	813 78
Lake	Queen	Ashbridge's Bay	362 80
Lane between Borden and Lippincott	Ulster	Harbord	16 98
Lane east of Portland.	Adelaide	King	4 12
Lane between St. Patrick and D'Arcy	Beverley	Huron	324 71
Lippincott	Wells	C. P. R	156 00
Lowther	Bedford	St. George	140 00
Lane rear of Francis			47 50
Mowat Av	King	South terminus	2,937 97
Maple Av	Dale	Glen Road	244 14
Mill	Beachall	Water	253 27
Markham	Bloor	London	49 33
Melville	Christie	West end	154 89
Markham	London	Johnston	92 71
Mansfield	Bellwoods	Grace	9 32
Melinda	Yonge	Bay	49 09
Margueretta	Bloor	North terminus	1,055 65
Manning Av	Robinson	Present terminus	296 00
Notre Dame	Roncesvalles	Sorauren	160 00
Northern Pl	Shirley	Railway track	43 10
Ontario	King	Duke	575 16
Ossington	Bloor	C. P. R	660 25
Perth	"	South terminus	695 23
Pape Av	Queen	Eastern Av	189 85
Park Rd	Rosedale	Woodland Av	133 78
Radenhurst	River	Don	90 12
Richmond	Simcoe	Duncan	279 77
Rusholme Rd	Hepbourne	Bloor	210 00
Spadina Cres	All round		247 06
St. Lawrence	King	Eastern Av	43 00
Salem	Bloor	Union	249 30
Shanley	Dufferin	Deleware	430 95
Stanley Park	King	Defoe	11 47
St. Anne's Rd	Rusholme	230 ft. west	7 19
Sherbourne	South Drive	Rachael	505 53
Symington	Bloor	Earnest	252 93
Smith	Logan	Carlaw	124 32
Tannery Hollow	Yonge	Avenue	927 50
Turner Av	Niagara	West end	54 00
Verral Av	Queen	North terminus	587 27

SEWERS (*Continued*).

Street.	From	To	Dr.
			$ c.
Vine	Eastern	Front	8 39
Victoria	Adelaide	King	43 91
Wellington	Bay	York	226 54
Woodlawn Av	Yonge	West terminus	388 00
Wells	Bathurst	Kendall	292 00
Walmer Rd	Present ter'us of sewer	North end street	104 00
Withrow Av	Logan	Pape	237 30
			29,459 40
		Total	179,476 42

STREET EXTENSIONS, WIDENINGS, OPENINGS, BRIDGES, Etc.

		$ c.
Barton Av	Extension	4,632 00
Carlton "	Widening	6,764 25
Dundas	Bridges	2,175 01
Dagmer Av	Widening	528 00
Gerrard	Subway	4,861 44
Gladstone Av	Grading	1,019 02
Glendale "	"	53 20
Huxley	" and extension	565 22
Hawthorne Terrace	Extension	19 70
Hoskin Av	"	12 00
Jones "	Grading	388 33
Kippendavie Av	"	613 00
Lane to McKenzie Cresent	Extension	295 00
Markham	"	3,098 11
Palmerston Av	Grading	9 00
Rosedale Valley Road	Opening	7,134 20
Ross	Grading	426 31
Sherbourne	Bridge	24,080 95
Smith	Grading and Draining	96 12
Sully	Widening	1,139 00
Sunnyside Av	Extension	358 69
Victoria	"	44,034 54
		102,303 09
Cr.		
Carlaw "	Extension	759 85
Olive Av	"	100 00
Sylvan Av	Grading	7 50
		867 35
	Total	101,435 74

PATENT SIDEWALKS.

Street.	Side.	From	To	Dr.
				$ c.
EUREKA:				
Beverley	East	Cecil	Baldwin	129 60
College	North	Robert	Major	139 88
Gladstone Av	East	Queen	100 feet north	1,287 04
Gerrard	South	Cor. Yonge		127 23
Jordan	West	1st l. w. of Welling'n	30 ft. north	74 31
King	South	York	78 ft. west	306 48
"	North	York	Simcoe	137 61
Melinda	Both	Bay	Yonge	2,745 60
Queen	North	Esther	Vanauley	240 11
"	"	"	Denison Av	122 35
"	South	"	Bathurst	3,826 50
"	North	Palmerston	171 ft. west	800 24
"	South	Spadina	Esther	3,432 75
"	North	Seaton	Ontario	1,159 74
"	"	Denison	Bathurst	3,514 75
"	"	Berkeley	Parliament	1,569 76
Wood	"	Yonge	130 ft. east	26 60
Yonge	East	Wood	Alexander	164 40
"	"	Carlton	Wood	1,192 57
				20,997 52
		Cr.		
Jordan	East	Wellington	King	176 97
				20,820 55
EXCELSIOR:				
Brunswick Av	East	College	108 ft. north	76 95
College	North	Spadina	Robert	1,258 48
"	"	Major	Borden	761 92
"	"	Borden	Palmerston Av	8,113 72
"	South	Markham	Augusta	412 76
				10,623 83

PATENT SIDEWALKS—(*Continued*).

Street.	Side.	From	To.	Dr.
				$ c.
GRANOLITHIC:				
College	South	Spadina	Augusta	445 53
Gerrard	Both	Jarvis	Sherbourne	3,578 47
King	"	Dufferin	East limit of Incline	2,409 25
Queen	North	280	Spadina	423 02
"	South	Cor. Victoria		92 56
"	"	Opposite J. Smith's	Property	883 97
Spadina Av	East	Cecil	Baldwin	472 48
"	West	College	Crescent	291 76
"	East	Queen	Grange	5,281 03
"	West	Nassau	Clyde	171 44
"	"	"	Oxford	1,417 52
Wellington		At Hunter & Rose's Cr.		437 12
				15,904 15
Dundas	West	Humbert	67½ ft. north	3 29
				15,900 86
STONE:				
Adelaide	South	Front of Court House		989 58
Front	North	York	Bay	440 00
"	South	Front of Walker House		116 25
Grenville	North	Yonge	Surrey Pl	2,680 16
Queen	"	Cor. McCaul		160 88
"	"	St. Patrick's Market	John	164 03
"	"	Beverley	130 ft. east	70 00
Yonge	East	Adelaide	Carlton	757 74
"	West	College	Bloor	1,718 32
"	"	Queen	College	7,200 69
				14,297 65
		Total		61,642 89

WOODEN SIDEWALKS.

Street.	Side.	From	To	Dr.
				$ c.
Avenue Rd	West	Boswell	Davenport	140 39
Aitken	Both	Brock	East limit	92 85
Admiral Rd	West	Lowther	Bernard	298 40
Avenue	South	University	East End	173 51
Augusta	East	St. Patrick	College	754 21
Agnes	South	Terauley	University	270 36
Avenue Rd	West	Rathnally	North City Limit	42 13
Brunswick	"	Bloor	Wells	404 50
Bloor	South	Avenue	Spadina	591 24
"	North	Dovercourt	Givens	354 75
Balmuto	West	Hat Factory	Bloor	3 53
"	East	Czar	"	146 36
Bulwer	South	Spadina	Soho	13 40
Bloor	North	Bathurst	Givens	913 03
Barton	"	Manning	Bathurst	4 50
Bay	East	King	Adelaide	107 14
Bathurst	West	"	Queen	360 09
Brock	Both	Queen	Clark	803 63
Bernard	South	Avenue Rd	382 ft. west	107 69
Bloor	North	Mackenzie	Northern R'y Track	138 13
Brown	Both	Brock	West End	220 47
Bedford Rd	West	303 ft. n. of Lowther	400 ft. north	115 20
Collier	Both	Gwynne	East End	53 10
Crawford	East	250 ft. n. of Arthur.	1,216 ft. north	272 85
Clinton	Both	Barton	North End	378 50
Callandar	East	Queen	50 ft. s. of n. end	19 00
Claremont	West	Arthur	Queen	563 88
Cecil	North	Beverley	Spadina	261 66
Claremont	East	Queen	Arthur	117 50
Carlton	North	Bleeker	Ontario	115 53
"	"	Parliament	Sackville	280 44
"	South	"	Sumach	367 49
Cameron	East	Queen	Cameron Pl	209 06
Cameron Pl	Both	Cameron	Vanauley	98 02
Carlaw	West	Queen	Eastern	341 20
"	"	Eastern	Lake	415 46
Castle Frank Av	"	Dale	150 ft	38 54
Clyde	North	Spadina	Augusta	216 94
Curzon	East	Queen	Sproatt	464 45
Chestnut	West	"	Osgoode	139 79
Collier	South	"	East End	72 94
Clarence Square	North	Wellington	Spadina	129 80
Concord	East	Dewson	Hepbourne	256 57
Clifford	North	Strachan	Walnut	120 58
Centre	Both	Avenue Lane	South End	1,151 55
Cawthra Square	"	Jarvis	West End	163 32
Colborne	North	117 ft. e. of Yonge	Leader Lane	144 65
Cunningham	South	Brock	West End	266 84
Defries	North	Ravenhurst	Mark	40 45

WOODEN SIDEWALKS—(*Continued*).

Street.	Side.	From	To	Dr.
				$ c.
Dundas	South	Brock	St. Clarence	156 91
Dunn	Both	Queen	Railway Tracks	14 00
Duncan	"	Roncesvalles	729 ft. east	289 77
D'Arcy	North	Spadina	McCaul	515 01
Davenport	"	Hazleton	Avenue Rd	121 39
Dovercourt	West	St. Anns	College	167 70
Dale Av	North	Castle Frank Rd	Maple	194 48
Dowling	West	G.T.R	Lake	247 66
Dundas	North	St. Clarens	Dufferin	481 34
"	West	"	195 ft. west	67 01
Duncan	Both	Adelaide	Richmond	145 69
Dufferin	West	Dundas	Bank	206 61
Defoe	North	Strachan	Stafford	74 45
Duke	South	Ontario	Parliament	197 93
Dovercourt	West	Point 125 ft. n. of Argyle.	89 ft. s. of Dundas.	262 97
"	"	Union	City Limit	30 94
Dupont	South	Davenport	St. George	64 56
Davenport	Both	Yonge	Hazleton	456 69
Euclid	West	Harbord	Johnston	42 28
"	East	Ulster	"	42 29
Elm	North	Yonge	Elm St. Church	124 70
Eastern	South	Laing	Lake	55 10
Elm	North	Centre	Teranley	210 55
"	"	Elm St. Church	"	118 57
Essex	"	Christie	West End	139 35
Elm	South	111 ft. n. of Yonge.	Terauley	220 29
"	"	University	Chestnut	170 00
Ernest	North	Perth	Symington	61 12
Elm	South	Terauley	Elizabeth	143 70
Fenning	West	Queen	Humbert	155 86
Franklin	East	Irvine	Royce	5 50
"	West	Royce	Edith	47 97
Fuller	Both	Queen	130 ft. s. of Munroe	459 21
Farley	North	Bathurst	Spadina	862 08
Fisher	South	Dufferin	Sheridan	105 14
Farley	"	Spadina	Augusta	10 76
Gloucester	"	Jarvis	153 ft. west	35 05
Gladstone	East	3,547 ft. n. of Argyle	216 ft. n. of Cross	136 41
Garnett Av	South	Christie	Millar	103 42
Gerrard	"	Broadview	Don Bridge	163 81
Grosvenor	Both	Yonge	Surrey Pl	319 88
Gwynne	West	Bismarck	Bloor	76 43
Grafton	Both	East terminus	Roncesvalles	308 76
Grange	South	Beverley	John	61 87
Givens	East	563 ft. s. of Bloor	1,542ft. south	296 68
Gerrard	North	Parliament	Sackville	201 71
Grange	"	Spadina	Larch	59 01
Gerrard	"	River	Don	168 45

WOODEN SIDEWALKS—(*Continued*).

Street.	Side.	From	To	Dr.
				$ c.
Gordon	South	Dufferin	Sheridan	121 95
Grosvenor	Both	Yonge	St. Vincent	1,466 55
George	East	King	Duke	119 26
Gould	South	Yonge	Church	204 36
Gerrard	"	Logan	Jones	704 73
Goulding	Both	Markham	Palmerston	125 84
Givens	East	College	353 ft. south	103 88
Huxley	North	Dufferin	Jamieson	522 65
Howland	West	Bloor	Wells	400 18
Harold	Both	Christie	Miles Pl	207 12
Hoskin	"	St. George	Park Drive	14 32
Hayden	South	Church	East End	10 87
Howland	Both	Wells	C.P.R	60 06
Hallam	South	Dovercourt	Salem	117 43
Harbord	North	Markham	Palmerston	76 58
Hoskin	Both	St. George	Park Drive	263 34
Huntley	East	Earl	Isabella	81 49
Hayter	North	Yonge	Chestnut	342 38
Harris	West	Queen	Paul	146 73
Hayter	South	Yonge	Terauley	218 57
"	"	Mission	Chestnut	89 59
Henderson	Both	Manning	Grace	274 77
John	East	King	Grange Rd	392 05
Jones Av	Both	Queen	Danforth	121 50
John	West	Richmond	1st lane	27 40
"	"	Queen	Grange	198 90
Jemima	North	Logan	G.T.R	67 89
King	South	Bathurst	Niagara	379 37
"	North	Massey	Incline of subway	337 92
"	South	"	East end of subway	311 58
Ketchum	Centre	Davenport	Scollard	90 74
Lowther	Both	St. George	Walmer Rd	608 88
Logan	West	Eastern	Bay	269 06
Landsdowne	Both	Queen	Union	185 53
Lakeview Av	West	Dundas	Harrison	37 00
Lisgar	"	Queen	Argyle	382 83
Lappin	North	Dufferin	510 ft. west	113 66
Lake	West	Queen	Bay	203 92
Leslie	East	Sproatt	1,400 ft. north	366 95
Marlborough	South	Yonge	Avenue Rd	313 35
Muir	"	Brock	Sheridan	50 46
Montague	Both	Queen	Harwood	226 61
Manning	"	Robinson	Arthur	303 07
McDonald	"	Queen	137 ft. n. Duncan	223 71
Massey	West	"	King	130 64
Maple Grove	North	Brock	O'Hara	30 38
Markets & License	Committee (St. Andrew's Market)			173 63
McPherson	Both	Rathnally	Poplar Plains	115 66
Morse	West	Eastern Av	Bay	390 37

WOODEN SIDEWALKS—(*Continued*).

Street.	Side.	From	To	Dr.
				$ c.
Maple Grove	South	Brock	O'Hara	30 37
Massey	East	King	Queen	330 15
McCaul	West	D'Arcy	Baldwin	73 16
McMurrich	Both	Walter	Davenport	249 77
Millstone Lane	North	212 ft. east	236 ft. west	51 30
Mission Av	Both	Gerrard	College	429 56
Markham	West	Arthur	886 ft. north	234 44
"	"	"	Robinson	479 94
Moutray	South	Brock	Sheridan	101 47
McCaul	We	Baldwin	College	293 62
Mitchell	North	Niagara	Tecumseth	197 87
Nassau	"	Bellevue	Bathurst	262 59
"	South	Lippincott	Augusta	226 96
Ottawa	Both	Shaftesbury	Summerhill	109 47
O'Hara Av	"	Queen	North limit	179 07
Orde	North	Murray	Avenue Pl	57 99
Oak	"	River	East terminus	94 55
Oxford	Both	Spadina	Augusta	680 85
Ontario	East	Wilton Av	Carlton	468 32
"	West	1st lane n. of Wilton.	Gerrard	225 89
Piper	South	Whole length		104 07
Perth Av	West	Ernest	1374 ft. north	265 67
Palmerston	"	Bloor	North end	980 07
Perth	East	"	Wallace	442 33
Parliament	West	1st lane n. of Wilton.	Gerrard	265 26
"	"	Howard	225 ft. south	66 92
Phœbe	Both	Spadina	Soho	1,062 01
Prince Arthur	North	Avenue Rd	620 ft. west	172 91
Parliament	East	Winchester	Amelia	141 90
"	West	Wellesley	St. James	171 15
Queen	South	Bay	York	363 50
"	North	Vanauley	142 ft. east	85 37
"	"	Euclid	130 ft. east	64 68
"	"	Yonge	Sherbourne	656 40
"	Both	Bellwoods	Strachan	673 06
"	South	Parliament	Sherbourne	647 58
"	North	West Lodge	Sorauren	365 60
"	"	Seaton	Lamb's block	95 71
"	"	Trefann	River	356 74
Roxborough	"	2021 ft. e. of Yonge.	175 ft. east	40 89
Ruskin	"	Edwin	Perth	97 92
Robinson	"	Bellwoods	Manning	115 89
River	West	King	Spruce	762 49
Richmond	North	Yonge	York	598 24
Regent	Both	Sydenham	Wilton	364 37
Robert	West	Harbord	Bloor	495 87
"	"	75 ft. n. of College	573 ft. north	265 54
Renfrew Pl	Both	McCaul	East end	47 75
Royce	South	Perth	Campbell	134 08

WOODEN SIDEWALKS—(*Continued.*)

Street.	Side.	From	To	Dr.
				$ c.
Regent	North	Regent	Blair	38 01
Robinson	"	Euclid	Palmerston	90 08
Sylvan Av	"	Dufferin	East limit	143 84
Salisbury	"	305 ft. e. of Sackville	Lane	53 01
Sackville	East	Wellesley	Cemetery fence	62 46
Spadina	West	Queen	Nassau	340 02
Sackville	"	Carlton	Winchester	26 69
Sussex	South	Major	Robert	66 67
Sherbourne	Both	Queen	Duke	182 24
Spadina	East	Opposite St. Clarence Square		102 78
St. Patrick	North	Spadina	Kensington	151 16
St. David	Both	Parliament	Sackville	269 70
Simcoe	West	Queen	220 ft. north	60 92
St. Helen's	"	Bloor	116 ft. s. of Pease	276 32
Strachan	Both	Queen	King	1,300 96
Spadina	East	Grange	Baldwin	591 20
Spruce	South	Sumach	300 ft. west	77 18
St. Nicholas	East	St. Joseph	161 ft. south	28 01
Strachan	"	King	Railway track	373 14
St. Paul	West	"	200 ft. north	44 81
Salisbury	South	Sackville	204 ft. west	44 37
Sully	West	College	Sully Crescent	80 75
Sussex	Both	Major	Borden	324 12
Strachan	West	King	Bridge	394 77
Sproatt	South	Jones	Leslie	189 16
Sydenham	"	Sackville	Sumach	227 41
Simcoe	West	Anderson	Caer Howell	141 31
Spadina	East	Clarence Sq	Front	70 80
"	"	"	King	123 91
Stephanie Pl	South	Beverley	John	45 50
St. Joseph	"	St. Vincent	St. Nicholas	120 27
Sully	West	College	Bloor	287 72
Simpson	South	50 ft. n. of Logan	Howland	127 58
Spadina	West	Bridge	Railway track	90 26
Sumach	"	Sydenham	Gerrard	378 52
Sydenham	North	Ontario	Parliament	173 68
"	South	"	Sackville	360 59
St. Mary	"	Yonge	Chapel	169 09
St. Patrick	"	Spadina	Esther	306 87
Symington	West	Ernest	Wallace	179 68
Spadina	East	Bernard	650 ft. north	191 30
Sumach	West	Winchester	Amelia	103 72
Stafford	Both	King	Clifford	398 53
Terauley	West	Hayter	College	160 52
"	East	"	Buchanan	66 31
"	West	Queen	Albert	82 41
Treford Pl	South	Bellwoods	Claremont	59 24
Trinity	West	Front	Mill	127 23
Ulster	South	Borden	Lippincott	120 72

WOODEN SIDEWALKS—(*Continued*).

Street.	Side	From.	To	Dr.
				$ c.
Ulster	North	Bathurst	Lippincott	129 04
Vanauley	Both	Queen	Cameron Pl	135 58
VanKoughnet	North	Borden	Lippincott	62 42
Victor Av	Both	Howland	600 ft. west	193 66
Walmer	"	Lowther	Castle	233 60
West Lodge	East	Marion	South end of walk	135 28
Walmer	"	S. s. Lowther	90 ft. south	20 25
Wascana	Both	Sumach	E. terminus	104 55
Wellington	North	York	Simcoe	255 95
Westmoreland	East	Hallam	Union	169 96
Wallace	North	McKenzie	West terminus	118 91
William	Both	1st. lane n. of Queen	Caer Howell	575 61
West Lodge	West	Queen	240 ft. north	72 77
Wellington	North	Bay	York	398 85
Winchester	"	Metcalfe	Sackville	312 36
Walton	Both	Yonge	Elizabeth	395 71
Woodlawn	"	"	McDonald's fence	891 62
Wilton Av	North	Sherbourne	Seaton	101 82
Walmer Rd	Both	Castle	Dupont	385 32
West Lodge	East	Queen	240 ft. north	86 93
Wellington	North	Spadina	Portland	366 47
"	"	Dorset	John	62 51
Wright	Both	Macdonnell	Sorauren	403 58
York	"	Queen	King	1,047 41
Yorkville Av	South	Yonge	Avenue Rd	412 55
Yonge	East	100 ft. n. Shaftesb'y.	125 ft. east	116 92
				64,369 81
		Cr.		
Brown	South	Brock	West terminus	3 12
Kippendavie	Both	Queen	Lake	17 45
Queen	South	170 ft. w. of Niagara.	250 ft. e. of Strachan	44 11
		Total wooden walks.		64,305 13
		" patent "		61,642 89
		Total		125,948 02

INVENTORY.

MATERIAL, ETC., IN YARDS, DECEMBER 31ST, 1891.

Material.	Yard.	Quantity.	Rate.	Amount.
Lumber	Eastern	265,472 feet	$12 57	$3,336 98
"	Western	128,694 "	"	1,617 68
Nails	Eastern	54½ kegs	3 15	170 89
"	Western	44 "	"	138 60
Sand	Portland St.	6¾ yards	1 23	8 30
"	Eastern	6 "	1 03	6 18
Bricks	Portland St	5,285	7 90	41 75
"	Eastern	872	8 30	7 23
Gravel	"	10½ yards	1 03	10 82
"	Western	38½ "	1 23	47 36
Tamarac	Portland St.	84⅕ cords	7 60	642 20
Culvert grates	Eastern	4	1 60	6 40
"	Western	19	"	30 40
Cedar blocks	Eastern	94 cords	5 50	517 00
"	Western	38 "	"	209 00
" posts	"	5	15	75
" blocks	Portland St.	55.31	5 50	303 83
Smith's gullies	"	5	13 00	65 00
Portland cement	Eastern	1,270 brls.	2 73	3,467 10
" "	Portland St.	135 "	"	368 55
Cedar kerbing	"	26,412 feet	13 50	356 56
"	Eastern	1,310 "	"	17 68
Cement, Thorold	Portland St.	5 brls.	1 10	5 50
" "	Eastern	57 "	"	62 70
Crossing stone	"	1,337 feet	36	
"	"	906 "	30	753 12
St. George gullies	Portland St.	10		
" "	Eastern	15	25 50	637 50
Cobble stone	"	3¼ toise	10 75	37 63
Granite setts	"	52,385 | 2,183¾	1 99	4,345 25
"	Western	20 yds.		
Gutter stone	Eastern	749 feet	36	269 64
Gravel, lake	"	121½⅞	80	97 16
Inverts for 2x3 sewer	Portland St.	1,005	37½	376 88
Stone kerbing	"	835′ 6″	60	501 30
"	Eastern	852 feet	85	724 20
Scantling 6x6	"	4,032	12 65	51 00
Sewer lumber	Portland St.	3,978 feet	8 00	31 82
Macadam (Broken)	"	193 loads = 22½⅔ toise	16 50	374 64
" "	On Streets, etc.	47 2 4 / 1 2 8	"	779 46
Pipe, 6 in., Hamilton	Portland St.	366 feet	10⅛	37 05
" " "	Eastern	126 "	"	12 75
" " American	Portland St.	156 "	11¾	18 33
" " "	Eastern	206 "	"	24 20
" 9 in., Hamilton	Portland St.	42 "	17	7 14
" " "	Eastern	20 "	"	3 40
" " American	Portland St.	66 "	20¼	13 53
" " "	Eastern	64 "	"	3 12
" 15 in., "	Portland St.	200 "	49	98 00

INVENTORY—(*Continued*).

Material.	Yard.	Quantity.	Rate.	Amount.
Pipe, 15 in., Scotch.....	Eastern.....	6 "	45	2 70
" 18 in., "	"	72 "	60	43 20
Junctions, 15 in., American	Portland St...	3 pcs.	1 93	5 79
Bends, 6 in., " ..	" ..	5 "	39	1 95
9x6 Reducers " ..	" ...	6 "	1 00	6 00
Stoppers, 6 in., Hamilton..	" ...	251 "	05	12 55
Junctions, 12 in., Scotch..	" ..	15 "	1 10	16 50
" " " ..	Eastern.....	14 "	"	15 40
Bends, 6 in., Hamilton....	Portland St...	8 "	33¾	2 70
" 9 in., "	" ...	15 "	56¼	8 44
9x6 Reducers "	" ...	6 "	1 00	6 00
Hamilton Pipe Specials....	Eastern.....	abt. 32 feet	70	22 40
American " "	"	" 57 "	80	45 60
Pipe, 18 in., Scotch.....	Portland St...	54 "	60	32 40
				$20,867 21

INVENTORY.

PLANT AND TOOLS, DECEMBER 31st, 1891.

EASTERN YARD.

16	Crowbars	$16 00	
17	Hand Brooms	21 25	
5	Tamping Bars	10 00	
21	Hoes	21 00	
8	Rakes	7 20	
6	Handles for Brooms	1 20	
1	Sod cutter	1 50	
2	Stone Tongs	5 00	
1	Spanner Wrench	75	
11	Sod Pounders	50	
7	Drain and Sewer Pounders	7 00	
5	Padlocks	1 00	
3	Levels	75	
1	Square	50	
5	Shovels	2 50	
2	Bridge Wrenches	12 00	
5	Augers	12 50	
1	Pair Iron Blocks	75	
2	Monkey Wrenches	1 50	
1	Grindstone Frame	1 00	
65	Feet 1-inch Chain	2 60	
2	Coils Rope	60	
2	Ladders	2 00	
304	Feet 1½-inch Hose	100 00	
156	Feet Hydrant Hose	75 00	
350	Feet 1-inch Hose	100 00	
6	Sledges	5 10	
2	Timber Hooks	1 00	
3	Stone Hammers	3 00	
4	Round Mouth Shovels	2 00	
2	Square Mouth Shovels	$1 00	
4	Forks	6 80	
12	Grubs	18 00	
5	Picks	5 00	
7	Chopping Axes	7 00	
3	Hand Axes	3 00	
4	Hand Saws	6 00	
1	Hydrant Key	75	
2	Coils Line	2 00	
2	Cold Chisels	1 00	
3	Mason's Hammers	2 00	
1	Small Bar	50	
1	Small Tar Pot	2 00	
1	Tar Ladle	1 00	
2	Tar Dippers	1 00	
5	Block Pounders	30 00	
7	Coal Oil Cans	3 15	
2	Dippers	25	
7	Lanterns	7 00	
2	Lanterns, without Globes	1 50	
6	Oil Cans	1 50	
6	Cross-cut Saws	30 00	
1	Circular Saw	18 00	
10	Pails	2 50	
8	Paint Pots	80	
3	Paint Pails	30	
1	Paint Keg	25	
		$567 50	

WESTERN YARD.

24	Road Brooms	$30 00	
8	Road Scrapers	12 00	
5	Shovels	2 50	
8	Axe Handles	40	
6	Hoe "	1 20	
4	Galvanized Pails	1 00	
2	Shears	1 00	
5	Reaping Hooks	1 50	
6	Sledge Hammers	$4 50	
4	Hand Hammers	2 00	
6	Lamp Glasses	1 20	
14	Lanterns, complete	17 50	
12	Snow Shovels	3 60	
		$78 40	

PORTLAND STREET YARD.

21	Clay Forks	$35 70	
16	Hand Saws	24 00	
6	Hand Axes	6 00	
1	Chopping Axe	1 00	
11	Oil Cans	2 75	
35	Grafting Tools	35 00	
23	Pounders	115 00	
16	Picks	16 00	
27	Mauls	$27 00	
14	Crowbars	25 00	
2	Pinch Bars	3 00	
8	Tamping Irons	16 00	
4	Sieves	5 40	
29	Pails	7 25	
39	Lowering Ropes	14 00	
3	1½-inch Ropes	2 50	

PORTLAND STREET YARD—(*Continued*).

53 Grubs	$79 50	20 Lamps	$20 00
2 Nail Hammers	1 00	2 Sight Rods	1 50
5 Small Stone Hammers	5 00	1 Line	1 00
2 Large " "	2 50	6 Gasoline Torches	6 00
5 Sledges	3 75	8 Reflecting Lamps	8 00
1 Tape Line	2 00	6 Galvanized Iron Pumps	30 00
7 Wheelbarrows	17 50	2 Suction Pumps	20 00
1 Monkey Wrench	75	1 Small Forge	20 00
3 Shovels	1 50	1 Heavy Lever	1 50
4 Hoes	4 00	40 Feet Light Chain	1 00
1 Pair Boots, rubber	6 50	1 Drawing Chain	1 00
3 Hydrant Keys	2 00	9 Tool Boxes	49 50
1 Spirit Level	2 00		$633 10
2 Screens	10 00		

FOREMEN—SEWER DEPARTMENT.

18 Lamps	$9 00	18 Gates	$9 00
11 Ropes	4 00	6 Pair Rubber Boots	24 00
12 Oil Cans	1 80	1 Tamping Bar	1 50
33 Pails	8 00	1 Hoe	1 00
11 Iron Bars	11 00	6 Grubs	6 00
Hose	45 00	3 Forks	75
9 Barrows	27 00	5 Grafting Tools	6 00
15 Mauls	15 00	3 Shovels	1 50
3 Axes	3 00	1 Chain	1 00
2 Rammers	2 50	2 Hose Keys	1 00
6 Saws	6 00	2 Sledges	1 50
15 Pounders	60 00	1 Hydrant Key	1 00
3 Hammers	1 50	6 Spuds	1 50
9 Picks	9 00		$259 55
6 Hooks	1 00		

FOREMEN—STREET COMMISSIONER'S DEPARTMENT.

14 Axes	$14 00	26 Iron Bars	$12 00
3 Binding Chains and Traces	2 00	17 Grading Lines	17 00
68 Lamps	68 00	3 Large Lamps	3 00
4 Stone Hammers	4 00	5 Road Scrapers	50 00
3 Steel Wedges and Drills	1 00	11 Sweepers	6,050 00
10 Hand Saws	12 50	4 Watering Carts	400 00
19 Grubs	15 00	16 Hand Carts	160 00
3 Claw Hammers	2 25	9 Wrenches	6 75
11 Snow Ploughs	330 00	6 Spades	4 70
33 Wheel-barrows	115 50	12 Oil Cans	2 40
141 Brooms	42 30	7 Culvert Bars	5 25
119 Snow Shovels	35 70	2 Sidewalk Hammers	1 00
94 Hand Scrapers	141 00	7 Paving Hammers	14 00
21 Scythes	21 00	2 Chopping Axes	2 00
3 Post Hole Augers	5 00	3 Water Pails	1 00
8 Long-handled Shovels	2 00	3 Tool Boxes	15 00
18 Augers	45 00	5 Steel Bars	5 00
70 Picks	70 00	1 Stone Truck	75 00
15 Rakes	11 25	2 Gravel Screens	6 00
23 Sledge Hammers	17 25	11 Chisels	5 50
33 Pounders	165 00	8 Adzes	8 00
1 Boning Rods and Pickets	25 00	2 Bellows	40 00
28 Culvert Scoops	28 00	2 Anvils	20 00
3 Pinch Bars	4 50	2 Vices	10 00

FOREMEN STREET COMMISSIONER'S DEPARTMENT—*(Continued)*.

1 Tap and Die	$30 00
1 Bolt Clippers	4 00
13 Tongs	15 00
1 Ratchet Brace	1 00
1 Wood Brace	1 25
6 Wood Bits	2 00
1 Drilling Machine and Drills	30 00
3 Grind Stones	1 50
2 Spanner's Wrench	1 00
2 Screw Drivers	50
1 Shoeing Hammer	60
1 " Pinchers	30
3 " Rasps	3 00
1 Woodworkers' Vice	3 00
3 Cold Chisels	75
1 Cutting Bar	50
4 Single Self-Lifters	2,800 00
2 " " (unfinished)	150 00
1 Single O'Neil Sweeper	350 00
1 J. C. Howard "	550 00
1 Barnhart-Cassell "	75 00
1 Heaper	25 00
4 Shovels	1 50
1 Shears	40
2 Scoop Shovels	60
2 Broad Axes	2 00
1 Cross-Cut Saw	4 00
4 Squares	2 00
2 Rip Saws	$1 75
2 Logging Chains	2 00
12 Small Hammers	5 00
5 Asphalt Brooms	5 00
1 Drawing Knife	50
3 Gouges	1 50
1 Snips	1 00
2 Gimlets	50
1 Plane	1 00
4 Forks	2 50
1 Crow Bar	1 00
5 Step Ladders	5 00
2 Long Ladders	3 00
6 Tape Lines	18 00
2 Hydrant Wrenches	10
2 Trestles	4 00
4 Post Hole Scoops	3 00
1 Tool Basket	50
2 Mallets	1 00
3 Scythe Stones	75
	$12,206 15
7 Horses and Buggies, 2 Carts, 2 Cutters, Harness, Robes, etc.	2,600 00
Total	$15,741 70

STOREKEEPER'S STATEMENT.

Material.	Quantity Received.	Quantity Used.	Balance on Hand.
Culvert grates	48	25	23
Smith gullies	6	1	5
St. George culverts	31	6	25
Inverts, large	999	999	
" for 2 x 3 sewer	1,011	1,011	
" 4½"	27	27	
" for 2 x 3 sewer	1,970'	965'	1,005'
Cobble stone	109.66	106.2	3.64
Gutter stone	1,040' 4"	291' 4"	749'
Stone kerbing	1,819'	983' 6"	835' 6"
Lake gravel	4,619.24	4,498.12	121.12
Macadam in city yards	548.31	525.29½	23.1½
Pipe, 6"	26,913'	26,065'	848'
" 9"	8,407'	8,215	192'
" 12"	1,038	1,038	
" 15"	1,312	1,106	206
" 18"	690	564	126
" specials	813	346.	467
Granite setts	127,786	75,181	52,405
Bricks	75,200	69,043	6,157
Sewer lumber	31,159'	27,181	3,978
Square timber	7,080	7,080	
Laths	13,500	13,500	
Stone for concrete	259.26'	259.26'	
Cedar kerbing	106,463	78,741	27,722
Tamarac plank	132,487	132 487	
Thorold cement	85	23	62
Portland "	3,208	1,803	1.405
Crossing stone	7,346'	4,993' 5"	2,352' 7"
Tamarac posts	260.26'	175.90'	84.64
Circular stone kerbing	1,002' 2"	150' 2"	852'
Cedar posts, cords	3,561.43'	3,373 64'	187,107'
Gravel	1,308¾	1,259¾	49
Sand	125	112¼	12¾
Lumber for sidewalks	3,784,144'	3,389,978'	394,166'
Nails	1,014	915½	98½
Macadam, miscellaneous (outside of yards)	419.70	372.70	47
Scantling, 6 x 6	7,056'	3,024'	4,032'

HUGH PATON,
Storekeeper.

TORONTO, December 31st, 1891.

APPENDIX "B."

AGREEMENT

BETWEEN THE CORPORATION OF THE CITY OF TORONTO AND GEORGE W. KIELY, WM. McKENZIE, HENRY A. EVERETT AND C. C. WOODWORTH, FOR TRANSFER OF TORONTO STREET RAILWAY.

[*Approved as to form, September 1st, 1891.*

C. R. W BIGGAR,
City Solicitor.]

THIS INDENTURE made in triplicate the first day of September, one thousand eight hundred and ninety-one.

Between the Corporation of the City of Toronto, hereinafter called "the Corporation," of the first part, and

George Washington Kiely, of the City of Toronto, Esq., William McKenzie, of the City of Toronto, contractor, Henry Azariah Everett, of the City of Cleveland, in the State of Ohio, Secretary of the East Cleveland Railway Company, (Electric) and Chauncey Clark Woodworth, of the City of Rochester, in the State of New York, Esquire, hereinafter called "the Purchasers," of the second part.

1. Whereas by virtue of an Act of the Legislature of the Province of Ontario, being 52 Victoria, Chapter 73, intituled, "An Act respecting the City of Toronto," the Corporation of the City of Toronto was empowered, after having acquired the ownership of the railways of the Toronto Street Railway Company and all the real and personal property in connection with the working thereof, to sell, lease or otherwise dispose of the same to any one or more persons, firms or corporations on such terms and for such periods as might be agreed upon between the City and the said persons, firms or corporations.

2. And whereas under and by virtue of another Act of the said Legislature, being 53 Victoria, Chapter 105, the said Corporation was empowered to proceed to arbitration, under the 18th Resolution of the Agreement therein referred to, in order to determine the value to be paid by the said Corporation to the Toronto Street Railway Company for the said railways and the said real and personal property.

3. And whereas the Corporation proceeded with the said arbitration, and an Award was duly made therein on the 15th day of April, A.D. 1891, whereby the said value was determined to be the sum of $1,453,788, inclusive of certain outstanding debentures charged upon the said undertaking to the amount $600,000.

4. And whereas the Corporation paid into the High Court of Justice, Chancery Division, the amount of the said award and acquired the said railways and property, and is now in possession and full enjoyment thereof.

5. And whereas the said Corporation resolved to sell the said railways and all the property so acquired by the City from the Toronto Street Railway Company, and also to dispose of the right to operate surface street railways in the City of Toronto as hereinafter mentioned, as more fully appears from the said

Award and from the Conditions, Tender and By-law which are annexed to this agreement, and made part and parcel thereof.

6. And whereas the Corporation advertised for tenders for the purchase of the said railways, property and privilege, and the Purchasers (Kiely, McKenzie and Everett) tendered therefor, and their said tender was duly accepted by the said Corporation.

7. And whereas a By-law authorizing the execution of an agreement between the Corporation and said Purchasers was duly passed by the said Corporation on the 27th of July, A.D. 1891, in pursuance whereof this agreement has been duly prepared and approved.

8. And whereas the said Purchasers have associated with them the said Chauncey C. Woodworth as a partner in the said undertaking

9. And whereas the value of the horses, cars, harness, stock and other moveable property and effects referred to in the fifth paragraph of the said Conditions and payable in cash has been settled for the purposes of this agreement at the sum of $475,000, and it has been agreed by and between the said parties that a first lien or charge shall be created by these presents upon all the property which is the subject of this agreement, and shall be held by the Corporation thereon for the balance (namely, for the sum of $378,788 and interest) of the amount of the said Award, subject only to the charge created by the said debentures to the extent of $600,000 with interest.

10. Now this Indenture witnesseth that the said Corporation, in consideration of the said sum of $475,000, now paid by the Purchasers to the Corporation (the receipt whereof is hereby acknowledged), and of the premises, doth by these presents, in pursuance of all the powers in that behalf enabling it so to do, sell, grant and assign to the Purchasers, their heirs, executors, administrators and assigns, all the said railways and property acquired by the Corporation from the Toronto Street Railway Company as aforesaid, under and in pursuance of the said Arbitration and Award, and also all the extensions, additions and renewals to the said railways and property real and personal, made by the Corporation during its ownership of the railway, subject to the said outstanding debentures and to the said charge above referred to and to all the conditions herein mentioned. *to have and to hold* to the Purchasers, their heirs, executors, administrators and assigns to their sole and only use, subject as aforesaid.

11. And this Indenture further witnesseth that the Corporation, for the considerations aforesaid, doth by these presents, in pursuance of all the powers in that behalf enabling it so to do, grant unto the said Purchasers, their heirs, executors, administrators and assigns for a period of twenty years from the date of these presents (which period shall be renewed for a further term of ten years and no longer in the event of legislation being obtained to enable this to be done, the said Corporation hereby undertaking at once, on request being made by the said Purchasers, to aid in procuring the needed legislation to authorize such renewal for such further period of ten years) the exclusive right for the said period of twenty years and the said extended period of ten years, in the event of the said needed legislation being obtained, and no longer, upon the aforesaid conditions to operate surface street railways in the City of Toronto, excepting on the Island and on that portion (if any) of Yonge Street, from the Ontario and

Quebec Railway tracks to the north City limits, over which the Metropolitan Street Railway Company claims an exclusive right to operate such railways, and the portion (if any) of Queen Street West (Lake Shore Road) over which any exclusive right to operate surface street railways may have been granted by the Corporation of the County of York, and also the exclusive right for the same term to operate surface street railways over the said portions of Yonge Street and Queen Street West (Lake Shore Road) above indicated, so far as the said Corporation can legally grant the same; but this clause and nothing contained in this agreement shall give, or be construed to mean or give to the Purchasers, the power to engage in any other business than that of operating surface street railways, as herein permitted.

12. And it is mutually understood, declared and agreed by and between the Corporation and its successors and the Purchasers, their heirs, executors, administrators and assigns, that the said Award, Conditions, Tender and By-law so attached hereto as aforesaid are incorporated with these presents and made part and parcel thereof, and the said parties mutually and respectively covenant, promise and agree with each other to carry into effect, observe, perform and fulfil all the provisions and stipulations therein contained and to be carried into effect, observed, performed and fulfilled by the said parties and their aforesaids respectively.

13. And the said purchasers for themselves and each of them for himself and for their and each of their heirs, executors, administrators and assigns, covenant, promise and agree with the Corporation, their successors and assigns, as follows: That they will fulfil all the conditions, stipulations and undertakings in this agreement contained, it being understood that the reference to particular matters to be performed by the Purchasers shall not diminish or limit the obligations of this agreement.

14. The said Purchasers and their aforesaids covenant as aforesaid with the said Corporation that they will pay to the said Corporation the said sum of $378,788, being the balance of the said award, in four equal quarterly payments on the first days of December, March, June and September next, or the first juridicial day thereafter respectively, with interest at the rate of five per cent. per annum from the date of this agreement on the amount thereof then remaining unpaid.

15. And that they will yearly and every year during the term covered by this agreement pay to the Corporation, through its City Treasurer, the sum of $800 per annum per mile of single track, or $1,600 per mile of double track, occupied by the rails of the said railways, within the said limits (not including turnouts, the length of which are to be approved by the City Engineer), in four equal quarterly instalments, on the first days of January, April, July and October in each year, or on the first judicial day thereafter respectively, the first instalment to be the proportionate part of the quarterly instalment accruing from the date of these presents to the first day of October next.

16 And that they will monthly and every month during the term covered by this agreement on the first Monday of each month pay to the Corporation, through its City Treasurer, the percentages in the said Conditions and Tender referred to, being the following percentages of gross receipts from passenger

fares, freight, express and mail rates, and all other sources of revenue derived from the traffic obtained by the operations of the said railways, namely:

On all gross receipts up to			$1,000,000	per annum,	8	per cent.
Between	$1,000,000	and	$1,500,000	"	10	"
"	1,500,000	"	2,000,000	"	12	"
"	2,000,000	"	3,000,000	"	15	"
And on all gross receipts over			3,000,000	"	20	"

17. And it is further understood, declared and agreed between the parties to these presents that should the Corporation within a reasonable time eliminate from Clause 31 of the said Conditions the provision requiring a class of tickets to be sold at the rate of eight tickets for twenty-five cents for use during certain specified hours of the day, then and in that event the said Purchasers, for themselves, their executors, administrators and assigns covenant, promise and agree with the Corporation and their successors that they will, in accordance with their said tender in that behalf, pay to the Corporation and its successors during the unexpired period of the said term covered by this agreement two (2) per cent. of the said gross receipts in addition to the percentages hereinbefore mentioned, such additional percentage to be payable monthly as aforesaid.

18. The Purchasers, in addition to the other considerations payable to the Corporation for the said railways and property, shall pay to the Corporation the following items, viz :

(1) The actual cost to the Corporation of the extensions and additions to the tracks made by the Corporation since the acquisition thereof.

(2) The actual cost to the Corporation of additions to plant and materials for the use of said railway handed over to the Purchasers.

(3) The actual cost to the Corporation of the new horses purchased since the railway has been acquired.

(4) One half of the actual cost to the Corporation of the painting, renovating and other repairing done to the cars, plant and appliances of the railway since the acquisition thereof from the Street Railway Company.

19. The Purchasers covenant that they will well and truly pay to the holders of said hereinbefore mentioned debentures as they mature the said sum of $600,000 thereby secured and interest thereon from the date of these presents, and will indemnify and save harmless the Corporation from all claims and demands in respect thereof.

20. That they will build and equip, or cause to be built and equipped, a car factory within the limits of the City of Toronto for the manufacture and repair of all the cars and railway plant used on the said railways, and will there continuously carry on, or cause to be carried on, such business and the manufacture and repair of all the said cars and railway plant during the term covered by this agreement, and that the performance of this clause may be specifically enforced by the order and injunction of the High Court of Justice.

21. And it is hereby agreed that all the said railway property liable to be assessed for school purposes shall be assessed for Public School purposes, and that the rates levied in respect thereof shall be payable to the Public School funds of the City of Toronto.

22. And it is further understood, declared and agreed between the said parties to these presents that the delivery over and acceptance of the said property shall not interfere with the rights of the parties under Clause 3 of the said Conditions, but that notwithstanding this act the Judge of the County Court of the County of York shall settle any difference that may arise between the parties in respect thereof, and the sum so settled by him shall be forthwith paid by the party liable to the party to whom the same is found due.

23. And it is further understood, declared and agreed by and between the said Corporation and the said Purchasers that if the said purchasers form a Joint Stock Company for the purpose of carrying this agreement into effect, then upon payment of the said sum of $378,788 and interest as aforesaid, the said Company shall, upon executing the necessary contract of substitution, be substituted for the said Purchasers, and the said Clause 23 of the said Conditions shall apply to such Company so to be formed as aforesaid, and shall cease to apply to the individual Purchasers, who shall thenceforward be discharged from all individual liability in the premises.

24. And it is further declared, covenanted and agreed by and between the parties to these presents that all the property the subject of this agreement is hereby charged with payment of all the moneys to be paid under this agreement as the purchase money of the said property.

25. And it is further covenanted and agreed by and between the parties to these presents that the payment of the said gross percentages monthly, and mileages quarterly, and the fulfilment of the obligations of the said Conditions shall be a lien and charge on the said railways and the property used in the working thereof, both before and after the incorporation of the said Company intended to be substituted as aforesaid in the place of the said Purchasers; but this provision shall not interfere with the right of such Purchasers or of the said Company, after the payment of the purchase moneys as aforesaid, to sell and dispose of any property which is not required for the operation of the said railways. All the property, however, which replaces that which may be sold or disposed of is to be charged under this clause as the original property is now hereby charged, and all after acquired property is to be in the same manner charged for the fulfilment of the said obligations.

26. And it is further understood, covenanted and agreed by and between the parties to these presents that a sufficient supply of each of the classes of tickets mentioned in the said Conditions shall at all times be kept for sale and sold to all persons desirous of purchasing the same on all cars while running through the streets of the City, and also at the public offices of the Purchasers.

27. And it is further understood, declared and agreed by and between the said parties that in fixing the allowance to be made for horses which have been sold by the Corporation, and therefore not forthcoming under the provision in Clause 3 of the said conditions, the Corporation shall only be liable to account for and pay the price realized on such sales.

28. And it is further understood, declared and agreed by and between the said parties that the system of accounts and bookkeeping to be adopted by the

Purchasers shall be subject to the approval of the City Treasurer and the Auditors appointed by the City.

29. And it is further covenanted and agreed between the parties to these presents that all conveyances, assurances and instruments necessary to carry out fully these presents shall from time to time be executed by the parties hereto, the same to be settled by James S. Cartwright, Q.C., Registrar of the Queen's Bench Division of the High Court of Justice, in case the parties differ about the same.

30. All outstanding car fare tickets issued by the Corporation or by the Toronto Street Railway Company prior to the date hereof shall be accepted as fares by the Purchasers when presented by passengers on the conveyances of the said railway subsequent to the date hereof, and the Corporation agrees that upon such tickets being returned to it from time to time, it will pay to the Purchasers the same prices therefor for which such tickets were issued by the Corporation and said Toronto Street Railway Company respectively.

In witness whereof the said Corporation has hereto affixed its Corporate seal under the hand of Edward Frederick Clarke, Esquire, Mayor of the said City, and Richard Theodore Coady, Esquire, City Treasurer and Keeper of the said Seal, and the said Purchasers have set their respective hand and seals.

Signed, sealed and delivered in the presence of

THOMAS CASWELL.
GEORGE KAPPELLE.

E. F. CLARKE,
Mayor.
R. T. COADY,
Treasurer.
CITY SEAL.

G. W. KIELY,
WM. McKENZIE, by his Attorney,
Nichol Kingsmill.
H. A. EVERETT,
C. C. WOODWORTH.

[L.S.]

THE AWARD, CONDITIONS, TENDER AND BY-LAW

REFERRED TO IN THE AGREEMENT HERETO ATTACHED, DATED THE FIRST DAY OF SEPTEMBER, A.D. 1891, BETWEEN THE CORPORATION OF THE CITY OF TORONTO AND GEORGE WASHINGTON KIELY, WILLIAM McKENZIE, HENRY AZARIAH EVERETT AND CHAUNCEY CLARK WOODWORTH.

CONDITIONS OF SALE OF THE STREET RAILWAY FRANCHISE OF THE CITY OF TORONTO, AS ADOPTED BY THE CITY COUNCIL, MAY 5TH, 1891.

1. The privilege to be disposed of is the exclusive right (subject as hereinafter provided) to operate surface street railways in the City of Toronto—excepting on "the Island" and on that portion (if any) of Yonge Street, from the Ontario and Quebec Railway tracks to the north City limits, over which the Metropolitan Street Railway Company claims an exclusive right to operate such railways, and the portion (if any) of Queen Street West (Lake Shore Road), over which any exclusive right to operate surface street railways may have been granted by the Corporation of the County of York—for a period of twenty years which shall be renewed for a further period of ten years in the event of legislation being obtained to enable this to be done; and the City will assist in endeavoring to secure such legislation.

(*a*) Over those portions of Yonge Street and Queen Street West (Lake Shore Road) above indicated, the purchaser shall have an exclusive right to operate surface street railways, so far as the City can legally grant the same

2. The party whose tender is accepted (and who is herein called "the purchaser"), must take over all the property to be acquired by the City from the Toronto Street Railway Company, as it stands on the date of the acceptance of the tender, including the rails, points and substructures of all tracks now laid, real estate, buildings, shops, rolling stock, horses, machinery, stock and all other articles covered by the award of the Board of Arbitrators, at the amount of said award.

3. Particulars of the said property are set forth in the Schedule attached to the award of the said Board of Arbitrators; but the City will only undertake as to the tracks actually constructed, and the real estate, buildings and shops that all of the articles mentioned in said Schedule will be forthcoming.

(*a*) The City will convey and deliver to the purchaser and the purchaser shall take over and pay for all the property and effects (whether mentioned in said Schedule or otherwise) which the City acquires from the Toronto Street Railway Company under the said award, and if anything mentioned in said Schedule is not forthcoming, or if anything is acquired by the City, as aforesaid, which is not specified in said Schedule, the purchase money to be paid as herein provided shall be subject to such increase or abatement as may be agreed upon between the City and the purchaser, or (in case they fail to agree within ten days after acceptance of tender) as shall be fixed by the Judge of the County Court of the County of York, who is hereby appointed sole arbitrator for that

purpose, with all the powers of arbitrators appointed under the sections of the Municipal Act relating to the appointment of arbitrators.

4. The purchaser must accept the title to the above properties which the City acquires or will acquire by virtue of the award of the arbitrators, and must search the same at his own expense, and the City is not to be bound to produce or show any documents or evidences of title except such as are in its possession or power.

5. The sum tendered for the above properties, except horses, cars, harness, stock and other moveable properties and effects (which are to be paid for in cash at the time the contract is entered into) may either be paid in cash or secured to the satisfaction of the City Treasurer, and paid in four equal quarterly payments, counting from the date of contract, and bearing interest at the rate of five per cent. per annum from May 16th, 1891, till paid.

N. B.—There is outstanding $600,000 debentures issued under the authority of the Act 47 Vict. (Ont.) cap. 77, bearing interest at six per cent. per annum, payable half-yearly, and forming a charge upon the undertaking as in said Act is provided. These debentures do not mature until 1914. The purchaser takes the property subject to this charge, and also to certain existing mortgages amounting to about $40,000, and assumes payment of these with the interest accruing thereon from date of purchase.

6. The purchaser shall not charge the undertaking with bonds or debentures for a longer period than the term of this contract, and must satisfy the City Treasurer that means are provided for meeting such obligations at maturity.

7. At the termination of this contract the City may (in the event of the Council so determining) take over all the real and personal property necessary to be used in connection with the working of the said railways, at a value to be determined by one or more arbitrators (not exceeding three) to be appointed as provided in the Municipal Act and the Acts respecting Arbitrations and References, and to have all the powers of arbitrators appointed under said Acts, and each party shall bear one half of the cost of the necessary arbitration at conclusion of term of lease, but the City shall only pay for the land conveyed by them to the purchaser, what it is worth, without reference to its value for the purpose of operating a street railway or railways.

8. The City will construct, reconstruct and maintain in repair the street railway portion of the roadways, viz., for double track, 16 ft 6 in., and for single track, 8 ft. 3 in., on all streets traversed by the railway system, but not the tracks and substructure required for the said railways.

9. The purchaser shall pay to the City Treasurer the sum of eight hundred dollars per annum per mile of single track (not including turn-outs), such sum or sums to be paid in four quarterly instalments as follows: January 1st, April 1st, July 1st and October 1st of each year, or on the first juridical day after each of the said days respectively, and shall also pay the City Treasurer monthly on the first Monday in each month per cent. of the gross receipts from passenger fares, freight, express and mail rates and all other sources of revenue derived from traffic obtained by operation of said street railway system. All books, accounts and vouchers kept by the purchaser shall be subject to monthly audit

by auditors to be appointed by the City Council, and all reasonable facilities for such audit shall be afforded by the purchaser.

TRACKS, ETC., AND ROADWAYS.

10. The purchaser shall maintain the ties, stringers, rails, turn-outs, curves, etc., in a state of thorough efficiency and to the satisfaction of the City Engineer, and shall remove, renew or replace the same, as circumstances may require, and as the City Engineer may direct. When a street upon which tracks are now laid is to be paved in a permanent manner, on concrete or other like foundation, then the purchaser shall remove present tracks and substructures and replace the same, according to the best modern practice, by improved rails, points and substructures of such description as may be determined upon by the City Engineer as most suitable for the purpose, and for the comfortable and safe use of the highway by those using vehicles thereon, and all changes in the present rails, tracks and roadbed, construction of new lines or additions to present ones, shall be done under the supervision of the City Engineer and to his satisfaction

(*a*) In the event of the purchaser desiring to make any repairs or alterations to the ties, stringers, rails, turn-outs, curves, etc., on paved streets, the purchaser shall re-pave the portion of the roadway so torn up at his own expense.

11. When the purchaser desires or is required to change any existing tracks and substructures for the purpose of operating by electric or other motive power approved by the City Engineer and confirmed by the City Council, the City will lay down a permanent pavement in conjunction therewith upon the track allowance (as herein defined) to be occupied by such new tracks and substructures. This shall first apply only to existing main lines, and thereafter to branch lines or extensions of main lines and branches, as and when the City Engineer may from time to time recommend and the City Council may direct and require; but such tracks as are now laid on a permanently formed roadway, must, when so required as aforesaid, be changed by the purchaser as hereinbefore provided, without any change of roadbed being made or any expense occasioned to the City thereby.

12. The gauge of the system (4 ft. 11 in.) is to be maintained on main lines and extensions thereof, and branch lines and extensions thereof; and the location of the railway on any street shall not be made by the purchaser or confirmed by the City Council until plans thereof, showing the proposed position of the rails, the style of rail to be used, and the other works in each such street, have been submitted to, and approved in writing by, the City Engineer.

13. The tracks shall conform to the grades of the streets upon which they are respectively laid, and the purchaser shall not in any way change or alter the same without the written permission of the City Engineer.

14. The purchaser will be required to establish and lay down new lines and to extend the tracks and street car service on such streets as may be from time to time recommended by the City Engineer and approved by the City Council, within such period as may be fixed by By-law to be passed by a vote of two-thirds of all the members of said Council, and all such extensions and new lines shall be regulated by the same terms and conditions as relate to the existing

system, and the right to operate the same shall terminate at the expiration of the term of this contract.

15. No new lines or extensions of existing lines shall be open for traffic until the purchaser has obtained a certificate in writing from the City Engineer that the same have been constructed to his satisfaction.

16. The purchaser shall not extend any line of the said railways beyond the limits of the City, or acquire, own, control or operate a line or lines connecting or in conjunction with or adjoining a City line or lines forming practically prolongations thereof, without first having had the plans of the same [as to position, elevation and gradients on the highway or crossings of highways, or until an agreement has been entered into whereby such suburban line or lines will be altered (at purchaser's expense) to conform to the grades established by the City when the streets or routes become City property or within its limits], approved, in writing, by the City Engineer and confirmed by the City Council.

17. In case the purchaser fails to establish and lay down any new line, as aforesaid, and to open the same for traffic, or to extend the tracks and services on any street or streets within such period as may be fixed by By-laws of the City Council, to be passed as herein provided, the privilege of laying down such new lines or extensions on the street or portion of the street so abandoned by the purchaser, may be granted by the said Council to any other person or company, and the purchaser shall in such case have no claim against the City for compensation.

18. The City shall have the right to take up and replace the streets traversed by the railway lines, for the purpose of altering the grades thereof, constructing or repairing pavements, sewers, drains or conduits, or for laying down or repairing water or gas pipes, and for all other purposes within the powers of the Corporation, without being liable for any compensation or damage that may be occasioned to the working of the railway, or the works connected therewith.

19. The privilege hereby granted is also subject to any existing rights (statutory or otherwise) of any other corporation which now has power to open or take up the streets of the City, such rights to be exercised with the permission and under the direction of the City Engineer.

20. The purchaser shall, within one year from the 16th day of May, 1891, discontinue the use of the buildings as stables on Scollard Street and also the buildings on Yorkville Avenue.

21. The track allowances (as hereinafter specified), whether for a single or double line, shall be kept free from snow and ice at the expense of the purchaser, so that the cars may be used continuously; but the purchasar shall not sprinkle salt or other material on said track allowances for the purpose of melting snow or ice thereon without the written permission of the City Engineer, and such permission shall in no case be given on lines where horse power is used.

22. If the fall of snow is less than six inches at any one time, the purchaser must remove the same from the tracks and spaces hereinafter defined, and shall, if the City Engineer so directs, evenly spread the snow on the adjoining portions of the roadway; but should the quantity of snow or ice, etc., at any time exceed six inches in depth, the whole space occupied as track allowances (viz: for double tracks, sixteen feet six inches, and for single tracks, eight feet three inches), shall, if the City Engineer so directs, be at once cleared of snow and ice, and the

said material removed and deposited at such point or points on or off the street as may be ordered by the City Engineer.

23. If the purchaser becomes bankrupt or insolvent, or makes any assignment for the benefit of creditors, or becomes subject to the operation of any Winding-up Act, or allows an execution against his goods or lands to remain in the hands of the Sheriff of Toronto unsatisfied for more than ninety days, then and in any such case all the rails, stringers, ties, turn-outs, points, sidings, etc., shall become the property of the City without compensation to the purchaser.

24. Electric or other new system of motor, or a combined system, approved by the City Engineer and confirmed by the City Council as suitable, shall be introduced within one year, and used upon such portions of the following streets as may be required by the City Engineer and approved of by the Council, within three years of the date of contract, viz: Queen Street, from the eastern City limit to High Park (or as near thereto as the City may then have power to grant a right to operate a line on said street); King Street, from its intersection at Queen Street and River Don to intersection with Queen Street at Roncesvalles Avenue; Front Street, from Simcoe Street to Frederick Street; Yonge Street, from Front Street to Ontario and Quebec Railway tracks; Frederick and George Streets, from Front to King Street; Sherbourne Street, from King Street to North Drive; Elm Avenue, from Sherbourne Street easterly to Glen Road; Spadina Avenue, from King Street to Bloor Street; Parliament Street, from Queen Street to Carlton Street; Gerrard Street, from Greenwood's Avenue to Parliament Street; Carlton Street, from Parliament Street to Yonge Street; College Street, from Yonge Street to Jameson Avenue, at intersection of Dundas Street; Dundas Street, from Queen Street to the Bridge; Bloor Street, from Sherbourne Street to Roncesvalles Avenue; York Street, from Front Street to Queen Street; McCaul Street, from Queen Street to College Street; Bathurst Street, from King Street to the Canadian Pacific Railway tracks; and Broadview Avenue, from Queen Street to Danforth Avenue.

25. Until such changes are carried out in such a manner as will permit its disuse, horse power may be continued on branch and other lines, or parts of same, under written permit from the City Engineer, who shall also have the right to order extra horse power to be employed on steep grades.

26. The speed and service necessary on each main line, part of same or branch, is to be determined by the City Engineer and approved by the City Council.

Day Cars.

27. Day cars are to commence running on all routes not later than 5.30 a.m., and to run until 12 o'clock midnight, at such intervals as the City Engineer, with the approval of the City Council, may from time to time determine.

Night Cars.

28. Night cars shall be run on such routes and at such hours and intervals as may be deemed necessary by the City Engineer and approved by the City Council.

TICKETS AND FARES.

29. Single (cash) fares are to be five cents each.

30. Fares on night cars are to be double the ordinary maximum single fare rates.

31. A class of tickets must be sold at the rate of 8 for 25 cents, the same to be used only by passengers entering the cars between the time the day cars commence running and 8 a.m., and between 5 and 6.30 p.m.

A class of tickets must be sold at the rate of 25 for $1, and

Another class at the rate of 6 for 25 cents.

32. Children under nine years of age, and not in arms, are to be carried at half fare rates, and infants in arms are to be carried free; school children are to have school tickets at the rate of 10 for 25 cents, only to be used between 8 a.m. and 5 p.m., and not on Saturdays.

33. The payment of the fare shall entitle the passenger to a continuous ride from any point on the said railway to any other point on a main line or branch of said railway within the City limits; and to enable this service to be carried out, transfer arrangements must be made by the purchaser to meet with the approval of the City Engineer and the endorsation of the Council.

34. Police Constables in uniform, Detective Police Officers in the employ of the City, and (while a fire is in progress) members of the City Fire Department in uniform, shall be carried free.

35. The purchaser shall be liable to, and shall indemnify the City against, all damages arising out of the construction or operation of the said railway system.

CARS.

36. Cars are to be of the most approved design for service and comfort including heating, lighting, signal appliances, numbers and route boards. They must be kept clean inside and out, and shall not exhibit advertisements outside unless under permit from the City Engineer. The platforms must be provided with gates. Cars are to be used exclusively for the conveyance of passengers, unless otherwise permitted by the City Engineer, and smoking will only be allowed on the front platform of closed cars, and rear seat and platform of open cars.

CONDUCTORS.

37. Each car is to be in charge of a uniformed conductor who shall clearly announce the names of cross streets as the cars reach them. Conductors shall not permit ladies or children to enter or leave the cars while the cars are in motion, and shall only receive and discharge passengers on right or curb side of vehicle on double track routes. On branch or light suburban lines, where horse-power is permitted, single horse cars may be run in charge of a uniformed driver.

38. Cars are not to be overcrowded a comfortable number of passengers for each class of cars to be determined by the City Engineer, and approved by the City Council).

Stopping of Cars.

39. Cars shall only be stopped clear of cross streets, and midway between streets where distance exceeds 600 feet. Cars to have right-of-way, and vehicles or persons not to obstruct or delay their operation.

Sunday Cars.

40. No cars shall be run on the Lord's Day until a Sunday service has been approved of by the citizens by a vote taken on the question.

Workmen.

41. No employe shall be compelled to work in the service of the railway for a longer period than 10 hours per day, or than 60 hours per week, or on more than 6 days per week, and no adult employe in the service of the railway shall be paid less than 15 cents per hour.

42. Nothing herein contained shall be taken as conferring upon the purchaser any right to construct or operate underground, overhead or elevated railways in the City of Toronto, or a surface railway on the Island, and the right to construct or operate, or to authorize the construction or operation of such railways in the said City, or in any part thereof, is hereby expressly reserved.

43. In case of any dispute or difference of opinion arising during the term of this contract between the purchaser and the City as to the meaning or construction of this specification, or of the contract to be prepared as herein provided, the same shall be determined on summary application after two clear days' notice to the other party by the person who, for the time being, fills the office of Judge of the County Court of the County of York, who may, as arbitrator, determine the same with the powers, as to costs and otherwise, of arbitrators under the Municipal Act, with right to appeal to the High Court of Justice for Ontario, whose decision shall be final.

44. The purchaser shall furnish to the City Engineer annually (on the first of January) a statement of tracks, cars and all plant and appliances on hand on that date, together with the value of the same.

Penalty.

45. A deposit in cash, marked cheque payable to the order of the City Treasurer, or other security, to the value of thirty thousand dollors ($30,000), and to the satisfaction of the City Treasurer, is to accompany each tender as a guarantee, returnable by City if offer not accepted. In the case of the successful bidder, the amount of the deposit will be retained until a formal contract, with bonds, etc., in the usual form of City contracts, and to be approved by the City Solicitor, has been duly entered into, and will be forfeited to the City if the party fails to completely execute the contract within thirty days after notification to enter into same.

46. In case of neglect or failure on the part of the purchaser to perform any of the conditions of the contract to be entered into in accordance with the above specification, the purchaser shall in each such case of failure forfeit and pay to the City the sum of $10,000 as liquidated damages and not as a penalty.

47. The purchaser shall provide a waiting room near the corner of Front

and York Streets (Union Station), suitable for the convenience of passengers taking the cars at this point.

N. B.—Persons who submit tenders on the foregoing specification may also submit offers or tenders on their own terms, and in such event one deposit shall suffice. Persons may also submit offers or tenders on their own terms.

CITY ENGINEER'S OFFICE,
Toronto, May 6th, 1891.

APPENDIX "C"

RE TORONTO STREET RAILWAY.

Toronto, October 12th, 1891.

Alderman A. McDougall,

Chairman Toronto Street Railway Committee, Toronto:

Dear Sir,—Herewith we beg to hand you statement of receipts and payments during time the railway was "run" by the City, viz., from 16th May to 31st August inclusive, showing a balance of $61,863.48.

We also enclose profit and loss statement for same period, which shows a net profit of $45,444.06. You will observe that this is after taking into account $36,983.31 for interest on debentures and bank loans.

We would also point out that the City paid for repairs as follows:

Car repairs	$4,080 89
Track repairs and reconstruction	2,813 38
Building repairs	891 12
	$7,785 39

whilst the late Company, by their statement laid before the Arbitrators, paid out for the twelve months $14,743.94, or a proportion of $4,300.31.

Yours truly,
R. & T. JENKINS,
Special Accountants.

Cash Account of James Gunn During His Management of Railway for City of Toronto from May 16th, 1891.

Receipts.

Daily car earnings, May	$29,232 92	
" " June	74,661 23	
" " July	75,355 85	
" " August	73,658 47	
		$252,908 47
Horse account—Horses sold		1,290 00
" —Received from Kiely-Everett Syndicate		8,077 50
Wages—Received from Toronto Street Railway Company their proportion of week ending May 21st, 1891		1,862 50
Rents—Received from Toronto Street Railway Company their proportion of rent to May 16th, St. Lawrence Street and Scollard Street property		52 50
Expense—Sundry receipts		6 00
Scrap iron—Sales		539 51

Debenture interest—Received from Toronto Street Railway Company their proportion to May 16th	$13,425 41
Car repairs—Received from sales of sundry articles	138 05
Feed—Received from sale of feed	1 50
Telephone—Received from Kiely-Everett Syndicate their proportion of rent paid in advance	31 26
Harness account—Received from Kiely-Everett Syndicate their proportion under agreement	56 00
Building repairs—Received from Kiely-Everett Syndicate their proportion under agreement	858 00
Car repairs—Received from Kiely-Everett Syndicate their proportion under agreement	3,966 42
Extensions and additions to track—Received from Kiely-Everett Syndicate their proportion under agreement	3,712 00
Guarantee bonds—Received from Kiely-Everett Syndicate their proportion on adjustment	158 42
Insurance—Received from Kiely-Everett Syndicate their proportion on adjustment	4,558 64
	$291,642 18

RECAPITULATION.

Receipts			$291,642 18
Payments			$229,778 70
Balance—In hands of City Treasurer		$57,039 38	
" Home Savings & Loan Co.		4,109 10	
" J. Gunn		500 00	
Due from City of Toronto:			
City Engineer's Department	$115		
Water Works "	20		
Medical Health "	80		
		215 00	
		61,863 48	
			291,642 18

Certified correct.

R. & T. JENKINS,
Special Accountants.

PROFIT AND LOSS STATEMENT FOR PERIOD DURING WHICH CITY OF TORONTO OPERATED RAILWAY (FROM MAY 16TH TO AUGUST 31ST, 1891, INCLUSIVE.)

Dr.

To Feed	$51,313 34
" Wages	72,801 88
" Car repairs	4,080 89
" Track repairs	1,594 23
" Water	31 00
" Rents	746 67
" Insurance	2,384 90

To Expense	$1,672 04
" Gas	814 97
" Horses	287 50
" Interest on Debentures	10,574 59
" Track construction and reconstruction	1,219 15
" Shop furnishings	5 07
" Damages	1 25
" Taxes and local improvements	1,596 21
" Telephone rents	98 30
" Guarantee bonds	66 58
" Shoeing	5,333 32
" Harness	1,161 21
" Mill expenses	1,207 71
" Stable expenses	26,760 65
" Car grease	260 98
" Oil and lamps	220 94
" Building repairs	891 12
" Interest on bank loans	16,408 72
" Balance— Profit	45,444 06
	$246,977 28

Cr.

By daily car earnings	$246,737 77
" Scrap iron sold	239 51
	$246,977 28

Certified correct.

R. & T. JENKINS,
Special Accountants.

TORONTO, October 22nd, 1891.

Alderman McDougall, Chairman Street Railway Committee, Toronto :

DEAR SIR,—In acordance with resolution of your Committee of the 12th instant, we beg to enclose comparative statement showing the receipts of the railway from 16th May to 31st August inclusive, for the years 1890 aud 1891.

We endeavored to show the *aaily* increase or decrease, but owing to an alteration in the system of bookkeeping we were unable to give the daily items. The months will, however. we think, give the requisite information.

Yours truly
R. & T. JENKINS.

J

STATEMENT SHOWING THE TRAFFIC RECEIPTS OF THE RAILWAY FROM 16TH MAY, 1890, TO 31ST AUGUST, 1890, INCLUSIVE, AND FROM 16TH MAY, 1891, TO 31ST AUGUST, 1891, INCLUSIVE: THE LATTER BEING THE PERIOD DURING WHICH THE CITY OPERATED THE ROAD.

	1890.	1891.	Increase.	Decrease
May	$36,287 19	$29,232 92	.....	$7,054 27
June	66,958 42	74,661 23	$7,702 81	.....
July	77,283 70	75,355 85	.....	1,927 85
August	69,540 06	.....	.....	.....
NOTE—In 1891 the actual receipts were $73,658.47, but from this should be deducted $6,170.70, tickets redeemed from the Kiely-Everett Syndicate in September, leaving net amount of	.....	67,487 77	.....	2,052 29
	$250,069 37	$246,737 77	$7,702 81	$11,034 41
Net decrease		$3,331 60		

APPENDIX "D."

TORONTO STREET RAILWAY.

STREET MEASUREMENTS OF TRACKS, 31ST DECEMBER, 1891.

Street.	From	To	Single track.	Double track.
Queen	Lee	Roncesvalles	2,202	38,747
Broadview	Queen	Danforth	.....	6,826
Yonge	Front	C. P. Railway	148	12,714½
College	Yonge	Dufferin	.....	13,446
Dovercourt	College	Bloor	.....	2,846
McCaul	Queen	College	.....	3,338
Dundas	Queen	Lansdowne	1,029	5,916½
York	Front	Queen	.....	2,127½
Front	Frederick	Simcoe	370	4,632
Church	Front	Bloor	.....	8,482½
Carlton	Yonge	Parliament	.....	4,036
Gerrard	Parliament	River	650	1,450
George	Front	King	.....	252
Parliament	Queen	Winchester	301	3,504
Winchester	Parliament	Sumach	1,454	
Sherbourne	King	Bloor	.....	8,062
Sherbourne	Bloor	South Drive	473	1,100
King	Don River	Dufferin	.....	20,578
Spadina	King	Bloor	.....	8,051½
Bathurst	King	C. P. R.	.....	11,269
Frederick	Front	King	103	146
Bloor	Sherbourne	Dufferin	.....	15,932
Dufferin	King	G. T. R. (s.)	.....	1,690
			6,730	175,146½
Curves reduced to single track, and not covered by straight track			4,213½	

Total reduced to single track.....68.41 miles.

APPENDIX "E."

REPORT ON THE SYSTEM OF ELECTRIC STREET CARS FOR THE CITY OF TORONTO.

To the Mayor and Council of the City of Toronto:

GENTLEMEN,—In compliance with the instructions conveyed to me by resolution of the Committee appointed to deal with street railway matters, I recently visited various cities and electrical manufacturing establishments in the United States, with a view to determining from actual observation what was the best system of street car propulsion at present in use, so that, from the experience of other places, we in Toronto might be enabled to choose and adopt that which is the best. The places which I visited were: Buffalo, N.Y.; Cleveland, O.; Pittsburg and Allegheny, Penn.; Washington, D.C.; New York; Newark, N.J.; Albany, N.Y.; and Boston, Springfield and Milford, Mass. I also visited and examined the electrical manufacturing establishments of the Short and the Brush Companies, at Cleveland; the Westinghouse Company, at Pittsburg; the Edison Company, at Schnectady, N.Y.; the Thompson-Houston Company, at Lynn, Mass., and the laboratory and experimental works of Mr. Edison, at Orange, N.J. In the fortnight that I had at my disposal I have endeavored to make myself acquainted with all the latest improvements that have taken place in street car traction or propulsion.

Of the systems other than horse traction that present themselves for adoption in the street car service of Toronto, there are cable traction and electrical propulsion, for we may put aside, at once, steam motors as being unsuitable to our streets.

Cable traction in large and thickly populated cities is undoubtedly a great improvement over horse traction, and its introduction conferred a vast benefit on those cities requiring rapid transit for large numbers of passengers. It is, however, in many respects inferior to electric propulsion, and is unsuitable for the thinly populated districts surrounding a large city, where the numbers to be carried are small, and the cars run at considerable time intervals. I may, perhaps, briefly indicate to the Council some of the points in which cable traction is inferior to electricity as a motive power. At the outset there is a much heavier cost of construction in preparing the streets for cable traction than for electricity. Then, in working the system, a very large proportion (about thirty per cent.) of the power generated in the power house is absorbed in simply moving the dead weight of cable; and this dead weight must be moved whether one or one hundred cars are attached to the cable; with electricity the power absorbed is directly in proportion to the number of cars running.

Curves, switches and turnouts are difficult to manage with the cable; with electricity they are no more trouble than with any surface system.

For extensions to the suburbs, where traffic is light, the cable is unsuited. The large, dead weight of cable has to be moved constantly to provide for the conveyance of only a few cars, though it would be adequate for the conveyance

of a large number, and the same heavy construction works have to be undertaken for these few as for the many. With electricity, the cars running in the suburbs absorb only the amount of power required for their propulsion, and this power can be furnished from the power house by the addition of the requisite generators.

With the cable system the cars can move no faster than the cable; they can run slower only at the expense of great wear to the cable, and they cannot reverse their motion at all. With electricity the cars can run fast or slow, as desired; they can be stopped or run back by simply turning a handle, and are much more controllable and manageable in this respect than even are cars drawn by horses. The speed of the cable car is limited by the rate at which the cable moves: the speed of electric cars, up to 15 or 18 miles an hour, is limited by the condition of the roadbed on which they are travelling and the exegencies of the traffic amongst which they are moving. There are few cities that need and demand rapid transit in the suburbs more than does Toronto, and there are few cities to which an electrical system is better suited.

Passing by the cable system as being undesirable for adoption here, I go on to consider the electrical systems at present before the public.

They are three: the storage battery, the underground or surface conduit, and the overhead wire.

There is something very attractive about the idea of the storage battery system: that each car should carry with it the store of electricity required for the performance of its work, and that this store should be drawn upon at will, to run fast or slow as occasion required, without the intervention of any accessories in the shape of conduits or poles or wires. This would be the perfection of electrical locomotion, and the advent of such a perfect electrical system would be hailed with delight by all street car companies and electrical engineers. But this day has not yet dawned. The great difficulty that has to be contended with is the enormous weight of battery that has to be carried in order to supply even a moderate amount of power to the car. This weight of battery aggregates two and three-quarter tons for a car sixteen feet long that is capable of carrying, when some passengers are standing, about forty people. And even with this weight of battery the voltage obtained is little more than one-half that conveyed to cars running by other systems. To increase the voltage would mean adding more cells to, and increasing the weight of the battery, and this again would require a larger car for its conveyance, and more power to propel it. The Council will readily understand that with a power so limited, and so heavy a weight to be propelled, it is impossible to have anything but a most moderate rate of speed, that is not superior to that obtained from horses.

I examined two storage battery systems, one at Washington, D. C., and the other at Milford, Mass. At Washington four cars are running on a line that is two and one-third miles in length. The batteries are placed under the seats of the car and occupy the whole length of each side. At Milford there are five cars fitted with storage battery, but only two are running at any one time on the track, which extends altogether about six miles. The cars are used to relieve each other, and each car after making its trip is run into the power house to be

re-charged. At Washington the storage battery is used only in that part of the city where Congress has forbidden the erection of poles and wires. Outside this limit the Street Railway Company run electric cars on the overhead wire system. These are the only storage battery systems at work within the limits embraced by my tour of examination. There was one formerly running in Brooklyn, N.Y., but it has recently been abandoned. The Council will readily see that what is being done in storage battery work is small indeed as compared with that being done with overhead wire cars, in almost every city and small town in the States. From one of the power houses alone of the Boston West End Railway Company there are at present running 160 cars every day for nineteen hours a day, and the Company is constructing an immense power house at the present time that will operate 600 cars.

None of the electrical companies that I visited are doing anything at all in the line of developing the storage battery system. Mr. Edison himself, who is the leader in electrical invention, has apparently dropped the matter. The system seems now to have reached a point at which it rests until some further discoveries in electrical science shall be made. The improvement in the system that is required before it can be a practical success and generally adopted as a motive power on a large scale, is the discovery of some metal much lighter than lead that may take the place of the heavy lead plates now used in the battery, and a metal that may at the same time be capable of carrying as much or more electrical current than the lead plates now hold; or, the discovery of some means by which the lead plates now in use may be able to carry a much heavier charge of electricity than they now hold, and thus enable the weight of battery to be largely reduced while its power shall be increased. On some such lines as these the improvement of the storage battery system must proceed before it can be applicable to the running of the number of cars (at present about 150) required in this City at the speed necessary to give satisfaction. An electrical system would be of no value to Toronto unless it could afford rapid transit.

The underground or surface conduit system for conveying the current of electricity from the power house to the car running on the track, presents itself as a possible means of avoiding the use of poles. The difficulty that surrounds this system is in properly insulating the conductor so that the electricity may not be lost in continuous leakages. For street railway work this conductor must either be sunk below the ground or it must be on the surface; it cannot be raised above the surface as it would then form an obstruction to the vehicular traffic. In either of the conditions—below ground or on the surface—the conductor is subject to constant loss of electricity from imperfect insulation when subject to the changes of our climate. It seems impossible to guard against the losses that will take place from mud, rain and snow causing short circuits. In all the places that I visited I saw no example of this system at work, or even being attempted. I visited Mr. Edison's experimental works at Orange, N.J., and learned that he is at present working at a scheme by which the current shall be transmitted on one rail of a street railway system, taken up by the wheels of the car, passed through the motor, and returned by the other rail. Mr. Edison is endeavoring to insulate the rail, which shall be used as the conductor. But even if this insulation should be completely effected, it seems to

me that the system would be open to strong objections for use in street traffic. If a horse should happen to place his fore hoof on one rail while his hind hoof was on the other, he would form a "short circuit" which would draw through his body the whole current of electricity, with very astonishing results; or if a wagon should travel along the street with the wheels on both rails at the same time, as we frequently see done, a "short circuit" would be completed and the continuous current destroyed. But whatever may be the future of this system, or however difficulties that at present seem insuperable may be overcome, there is not at present any system of underground or surface conductor that is practically successful for use in street railway work, or any such system whose adoption I would recommend by the Council.

The third system that I have mentioned is that by which the electrical current is conveyed by an overhead wire, and drawn down to each car by a trolley pole making contact with the wire by means of the trolley wheel. This is the system which is now so largely used throughout the United States. With the exception of New York, where no electrical system is used, there is scarcely a city or town in the United States but now has its street cars propelled by electricity supplied on this system. In two of the places that I visited—Albany, N.Y., and Springfield, Mass.—the electric cars have already entirely displaced horse traction, and the street car horse is no longer seen on the streets of those cities. The wonderful rapidity with which electricity is establishing itself as the motive power for street railways may be learned from the following figures. At the beginning of 1888 there were throughout the United States about twenty electrical roads in operation, having a total of eighty miles of track, and working ninety motor cars. Early in 1890 this had grown to 1,670 miles of track and 2,650 motor cars. But, by the middle of September of the present year—that is little more than three years from the practical application of the system—the figures show 412 electrical companies in operation, on 3,000 miles of track, and using 6,732 motor cars. The following concise statement of the present extent of street railways in the United States and Canada is taken from the address of Mr. H. M. Watson, President of the Street Railway Association, delivered at the Pittsburg Convention, in October last:

Number of miles operated by				animal power	5,443
"	"			electricity	3,009
"	"			steam motors	1,918
"	"			cable	660
					11,030
Number of cars operated by				animal power	25,424
"	"			electricity	6,732
"	"			cable	3,317
"	"			steam motors	1,044
					36,517
Number of companies operating street railway lines by				animal power.	537
"	"	"	"	electricity	412
"	"	"	"	cable	54

This shows a remarkably rapid growth of the electrical system, and when we know that, with the exception of about twenty miles, all the above electrical mileage is worked by the overhead wire system, we are justified in saying that that is the only practical system at present available for operating street railway cars on an extended scale. The storage battery might be used on small level systems where only very few cars are run, at very considerable time intervals, and where no high speed is required, but it is unsuited to the large traffic of such a City as Toronto; the only system that is at present suitable and available is that of the overhead trolley wire.

This trolley wire is suspended at a height of eighteen or twenty feet above the ground, over the centre of each line of railway. When the streets are not too wide—that is where they do not exceed fifty or sixty feet between the kerbs—the trolley wire is carried by a suspending wire that is attached to poles placed at the kerb or either side and stretched across. These poles are, in the central parts of the City, most frequently made of iron; three sections of iron gas pipe are used, the lower section is usually about six inches in diameter and the upper sections somewhat smaller. The height of the poles is about twenty feet above ground, and, when neatly made and painted, they are no more unsightly or injurious to the appearance of the streets than are ordinary gas lamps. They are placed about 120 feet apart and usually carry the feed wire for the trolley wire. All the objectionable cross arms and vast net work of wires with which we are painfully familiar in connection with telephone and telegraph poles is absent on these electric railway poles. In streets that are too wide to place the poles at the kerb—such as our Spadina Avenue—they are placed in the centre of the devil-strip, and a bracket projecting on either side carries the trolley wire over the centre of each track. In those parts of the City where the trolley wire is crossed by numerous telephone wires it is customary to erect light guard wires about a foot above the trolley wire, so that in case of a telephone wire breaking it will be prevented from making contact with the trolley wire. This is a good precaution, and should be observed where the telephone wires come in proximity to the trolley wire. Considerable misapprehension exists in regard to the danger arising from these trolley wires. They are much less dangerous than electric light wires, as the voltage of the trolley wire is only 500, while that of the electric light wire is more than four times as great. A shock from a trolley wire, though giving a smart blow, is by no means fatal, and has been received by many men working about a car system without serious results. In case of the trolley wire breaking and falling to the ground, a simple "cut out," that works automatically in the power house, immediately renders it dead and harmless. The electricity is drawn from the wire to the motor car by the trolley pole in the manner that is doubtless familiar to the Council. Cars running on this system are wonderfully manageable and easily controlled. They can run fast or slow as desired; stop, when running at high speed, in about two car lengths; and can be reversed and run back at will. They are more easily handled and controlled than are cars drawn by horses.

In view of the facts which I have briefly laid before the Council, and of the experience which I have gained on my recent tour of examination, and from careful study of the question, I have to recommend to the Council that the

motive power which shall be forthwith adopted by the Toronto Railway Company and applied to the running of all street cars throughout the City of Toronto, in accordance with the terms and conditions of the lease of the Street Railway franchise from the Corporation of the City of Toronto to the said Toronto Railway Company, shall be that commonly known and designated as the overhead-single-trolley-wire-electric-system, and that the details of the erection, construction and maintenance of this system shall be subject at all times and in all particulars to the approval of the City Engineer of the City of Toronto: Provided (and this proviso is part of the recommendation that I make) that if at any time during the currency of the aforesaid lease or any extension or extensions thereof, the development of electrical invention shall be such that some other system of electrical propulsion better than that known as the overhead-single-trolley-wire-electric-system shall be invented and made practically workable for street railway traffic (and the City Engineer shall be the judge of this), that it shall be competent for the Council of the City of Toronto, on the recommendation of the City Engineer, to order and direct that this other system of electrical propulsion shall be used in place of that above described as the overhead-single-trolley-wire-electric system, and this other system of electrical propulsion shall then in that case forthwith be adopted and used by the said Toronto Railway Company, for the propelling and working of street cars on their railway system throughout the City of Toronto, subject to the terms and conditions of the said lease as aforesaid.

Before closing this report it is necessary that I should say something in regard to the width of the strip between the double tracks, commonly called the devil-strip. In the various places that I visited I found that there was great variation in regard to the gauge of the track and the width of the devil-strip. The gauge varied from four feet eight and a half inches to five feet two and a half inches, and the devil-strip from three feet to six feet. The usual width of the strip is from four to four and a half feet. In Pittsburg and Alleghany, however, the strip is only three feet wide, and in these cities the streets are narrower than in Toronto, and the vehicular traffic very much greater and more congested. On a street in Pittsburg (Smithfield Street) there is only thirty-four feet between the kerbs, a double line of tracks in the centre of the street, with a three-foot devil-strip, and on this street numerous electric cars travel backwards and forwards, crossing cable systems and other electric systems, while there is a vehicular traffic in excess of anything we have in Toronto, and yet accidents do not seem to take place. There can be no doubt, however, that, though not absolutely necessary, it would be expedient to widen this strip to four feet when laying down new lines or relaying existing lines in Toronto. The electric cars should not be wider than seven feet six inches from out to out, and with this there would be just nine inches clearance on a three-foot devil-strip when the cars were passing each other. I think it would be expedient to increase this width when relaying the tracks by widening the strip to four feet. But I am of the opinion that in the central parts of the City, on King, Queen and Yonge Streets, it would be greatly for the general good of the community to lay only single tracks on these streets, using Adelaide and Richmond Streets between Sherbourne Street and Spadina Avenue, and Victoria Street as far north as Ger-

rard Street, for the return traffic. Having before me the example of Pittsburg, I feel very strongly that it would be in the interests of this City to avoid such a condition of things here if any reasonable means can be found for so doing. In future years the vehicular traffic on our main streets may be expected largely to increase. The expense of widening our streets would be enormous, but the adoption of single tracks would be practically a widening of the street by giving up so much more of the space to vehicles. I discussed this question with the President of one of the electric railways of Pittsburg, and he was clearly of the opinion, from the experience of his own city, that it would be a great benefit both to the railway company and the community to have single lines on the crowded streets when parallel streets can be had close at hand for the return traffic. The car traffic can be handled so much more expeditiously and safely among a crowd of vehicles and pedestrians when there is only one track. This, however, is not a question of pure engineering: there are complicated questions of general municipal policy that arise or suggest themselves on this subject on which the Council is better able to express an opinion than I am. I would therefore not make any definite recommendation on the subject of single lines as indicated, only pointing out that from an Engineer's standpoint I would consider it the best plan to adopt, and requesting that the Council will consider the whole question and instruct me as to its opinion on the subject.

As this part of my report may possibly not be adopted until after some time has been allowed for discussion, I would respectfully suggest that the Council should as soon as possible adopt or reject that part of the report recommending the electrical system to be used by the Railway Company, in order that the Company may be able to proceed at once in making preparations for the introduction of electricity.

All of which is respectfully submitted.

GRANVILLE C. CUNINGHAM,
City Engineer.

Toronto, 23rd November, 1891.

APPENDIX "F"

REPORT OF THE CITY ENGINEER ON THE RECLAMATION OF ASHBRIDGE'S BAY.

To the Chairman and Members of the Committee Re Ashbridge's Bay Reclamation:

GENTLEMEN,—In accordance with the reference that has been made to me by the Sub-Committee, appointed to enquire into the schemes proposed for the reclamation of Asbridge's Bay, I beg to submit the following report on the subject. The scheme which is chiefly under the consideration of the Committee at present is that known as "Col. Alexander's scheme," and to that I shall in the following remarks chiefly direct my attention.

The primary reason for the reclamation of Ashbridge's Bay, and that part of the scheme in which the City and the general public are mainly interested, is to do away with the nuisance and the insanitary conditions that are created by the presence of a large pond of stagnant water into which the sewage and filth from the adjacent City is allowed freely to drain. This nuisance has grown to such an extent in recent years that it is apparent to all that something should be done—and done soon—to abate it. The doing of this is the prime object of the reclamation schemes, and the other parts of the schemes—the filling in of large tracts of marsh land, the laying out of streets and parks, the formation of building sites for factories, and the construction of wharves and docks for shipping—though gigantic works, are subsidiary and secondary considerations. It would doubtless be of some sanitary benefit to the City generally that the extensive works of filling in proposed by the schemes should be carried out, but in the first place what the City is interested in seeing done, is the cleansing of the Bay by opening it to a free flow of water and by stopping the further pollution of it. This would be effected by the formation of a channel along the northern shore of the Bay, fifteen feet deep by three hundred feet in width, protected on the north, or shore side, by a pile breastwork to hold up the filling, and by filling in behind this breastwork all the low and swampy lands to the height of some feet above water level, and by stopping the inflow of pollution. This channel should extend from Toronto Bay through to Coatsworth's Cut, at the eastern end, a distance of about three and one-third miles, and here an entrance from the lake with suitable crib protection should be formed. Further, the Don River should be connected with this channel by extending the line of the Don improvement to form a junction with the channel. The theory of this channel is that by the rise and fall of the lake level caused by wind action, *plus* the little impetus obtainable from the Don,* a current would be formed through the Bay that would do away with the stagnant condition of the water. These are the works that are primarily necessary for the cleansing of the Bay, and the cost of executing them would be in round figures about $650,000. This it is that the City—as it seems to me—desires to see done, and the main obstacle that stands in the way of doing it is the great expense, coupled with the difficulty, and probably further expense, of dealing with the riparian proprietors on the north

*There is practically no current in the Don except during the spring floods.

shore of the Bay whose property will be affected by the works in question. It is this obstacle of expense that has hitherto been a bar to the City's undertaking the work, and that has induced private companies to come forward and say, "If you will give us certain concessions in the form of the lease or sale of the Bay lands with immunity from taxation for a number of years, we will reclaim and cleanse the Bay and it shall cost the City nothing." This is the feature of the scheme that is the attractive one for the City; that the purifying of the Bay shall be done without cost to the City, and that the only remuneration asked by the Company for doing this work shall be the lease or sale to them of the Bay lands that are, in their present state, worthless to the City, together with immunity from taxation for stated periods. The broad outline of such a scheme as this is undoubtedly very favorable to the City. By the completion of the works the City would find the Bay purified, while there had been formed a large addition to the taxable area of the City, capable of bearing a very considerable population.

But by Col. Alexander's scheme the formation of the 300-foot channel along the north shore of the Bay, the close piling along the north side of this channel, the filling in of the low lands lying north of this, the extension of the Don Cut to form a junction with this channel is to be done, not at the expense of his Company, but at the cost of the citizens who are riparian owners on the Bay, and of the City in so far as it is a riparian owner, and in respect of the Don extension. (See Col. Alexander's Tender, sec. 1, s.s. 1, 2 and 8; also on p. 7, clause 2, 3 and 4). That is to say all the works that I have described as being primarily necessary for the purifying of Ashbridge's Bay (with the exception of the jetties or harbor entrance in the lake at the east end of the channel) are to be paid for by the City and the riparian owners jointly. The City is to bear the expense of any work in connection with sewers, though the Contractor undertakes not to obstruct the City in this work (Alexander's Tender, p. 3, sec. 9). The maintenance and repair of this pile work and the 300-foot channel is not to be undertaken by the Company, as the Tender in regard to maintenance (p. 7, sec. 1) refers only to works lying south and west of the 300-foot channel; except that sec. 31 on p. 5 might lead one to infer that the maintenance and repair of the 300-foot channel and the piling thereof is to be done for five years from the date of completion. There is no provision made for getting rid of the sewage, except as before mentioned, and in clause 30 of the Tender (p. 9), where the Contractor undertakes to make provision for the outlets of sewage at the cost of the City.

All this reduced to plain terms means that all the works primarily needed for the purifying of Ashbridge's Bay, such as might be carried out apart from any scheme for forming streets and building sites in the bay, are to be paid for by the property owners under Col. Alexander's scheme to just the same extent as they would be paid for apart from any scheme for the reclamation of the Bay lands, except that Col. Alexander's Company will pay for the construction of the eastern harbor entrance. I do not say that this is a fatal objection to the scheme (if the property owners, upon being consulted, are willing to pay for this work, no one should object) but I merely wish to point out to the Committee—what perhaps might be lost sight of—that the burden of the cost of doing the

works required for the Bay purification still rests upon the citizens, who are riparian owners (and upon the City in so far as it is a riparian owner) to the full extent; and that Col. Alexander's scheme merely offers to do this work for them at certain definite prices which are fairly remunerative. (Tender, page 7, sec. 2.)

So much of the position being clearly understood, and still keeping before our eyes the fact that it is these purification works which are primarily required, it remains to be seen in what way they are to be carried on and brought to completion under the Alexander scheme. In the first place it is quite apparent that the work to be of any value, must be carried out continuously and in its entirety. I am still speaking of the 300-foot channel with piling on the north side. It would be useless to do a patch here and a patch there with gaps of untouched work between. But to do this work continuously would require the assent of all the riparian owners, and there are over thirty of them. Now, it is not to be expected that in this number there will be none who will object to the doing of this work, and to the amount that they will have to pay for it. Some will not want to have it done at all, and others will think they are paying too much for it; some will no doubt claim that the work is an injury rather than a benefit, and that they should be paid damages for the injury done to their property. The settlement of these cases will involve tedious arbitrations with heavy expense to the Company, much as the City has experienced in the Don Improvement affair. From a rough statement I have had prepared, there are four proprietors who will be required to pay considerably over $10,000 each, three over $20,000, and one nearly $40,000. The refusal to pay, or to allow the work to be done, on the part of any of these, would cause a bar and stoppage to the whole undertaking. Therefore it seems to me that the first step to be taken before trying to begin work, is for Col. Alexander's Company to obtain power from the Legislature, to compel the assent (upon terms) of those of the proprietors who are unwilling or object. The collection of the money in payment for the work is of course a matter that more immediately concerns Col. Alexander's Company, but it seems to me also that it could be done only by power conferred by the Legislature, and much in the same manner that the cost of local improvements is collected under the local improvement plan. Col. Alexander's tender distinctly agrees that this part of his scheme shall be that which shall be commenced and carried to completion before anything else is done (see tender page 2, sec.3, sub-sec. 1 and 2), and it is this part of the work that the City is chiefly interested in seeing executed. But it would be worse than folly to rush into this work without being properly armed with the necessary power to carry it out, and therefore it seems to me that it is the City's duty to see that this power is obtained, or can be obtained, before committing itself to the scheme; and in the event of the scheme being sanctioned, that all these preliminary arrangements with the owners are properly in hand before work is started. The burden of the expense should rest entirely with the Company; and this should be clearly understood and set forth in the agreement between the City and the Company, as is stated in clause 11 of the tender, p. 3.

The formation of the harbor entrance in the lake at the eastern end of the 300-foot channel is a matter that comes under the Dominion Government, and

forms an integral part of the purification scheme. In this case, too, the assent of the Government to the scheme should be obtained, or assured, before the work is undertaken or the City committed to it.

But assuming that all these preliminary difficulties are successfully overcome, that the property owners are willing to allow the work to proceed, and that the terms upon which they are to pay for it are agreed upon and arranged, and that the City commits itself to the whole scheme, there remains to be considered the mode of carrying it out. I think it is a good feature in Col. Alexander's scheme that all the work should be carried out under Commissioners (tender, p. 3, sec. 4), and I think that all questions of detail of design and form of structure should be left to be settled by the commissioners. It is impossible, with the meagre information and limited time that we have, to think out and arrange all the details of design. Circumstances would certainly arise that would render important changes and modifications necessary, and a properly constituted Board of Commissioners would be the best authority to determine these. In many places in the Bay I expect that the bottom would be found too soft to hold piling, with the heavy weight of earth at the back, and cribbing would have to be substituted. The design of face piling submitted by Col. Alexander is, in my opinion, a weaker form than that where the piles are left to the full height of the breastwork. I should prefer to see the piling left the full height, and the back made tight with planking, so as to prevent the earth filling from working out between the piles, rather than have the upper half formed of a timber wall, as Col. Alexander shows in his plan "A." The question of this design, however, as well as the design of the other structures—the jetties, swing bridges, slips, lake protection, etc., etc.—should be left entirely to the commissioners spoken of. Even the general outline plan of the work must be left subject to modification and revision by the same authority. The length of the tongue of land that Col. Alexander proposes to construct to the south of the 300-foot channel, whether this tongue should have one or more openings left through it for the passage of boats, the distance that this tongue should be placed from the face piling on the north shore, are questions upon which discussion and difference of opinion would certainly arise, and questions in which the property owners on the north shore would be peculiarly interested and claim the right to be heard. Again, at the ends of all street extensions, arrangements should be made for proper access to boats lying in the water, either by ramping down the breastwork or otherwise. These and all such questions should be left to the Commissioners to deal with and decide.

The "personel" of this Commission is also a matter of considerable importance. Col. Alexander proposes that it should consist of the Chief Engineer of the Department of Public Works of Canada, the City Engineer of Toronto, and an engineer to be appointed by the Contractors (*i.e.* the Company), and that these three shall have power to appoint Engineers or Inspectors, and that a decision of a majority of the three Engineers shall be final and conclusive. (Tender, page 3, sec. 4). Whether the Council would approve of such a Commission as this is for the Council to say, but the Dominion Government might not approve of it, or the Chief Engineer of the Department of Public Works might refuse to serve on it, and in that event some alternative mode of forming

a Commission should be agreed upon. And in any event the formation of the Commission, with sub-engineers and inspectors, implies expense in the payment of salaries, wages, office and travelling expenses, and it should be clearly stipulated and agreed that these expenses should be borne by the Contractors and not thrown upon the City.

Before leaving the question of construction it is necessary to say something in regard to the provision to be made for the sewage that now flows into the Bay. Col. Alexander's tender plainly contemplates that at any rate his Company is not to bear any expense in regard to that, as no mention is made of it, except that which I have already alluded to in Clause 9, on page 3 of the tender where he undertakes that the Contractor shall not obstruct the City in doing any work in connection with sewers, and in clause 30 on page 5. But it seems to me that this matter of providing for the sewage and preventing the continued pollution of the bay, is really at the root of the whole question of cleansing the Bay, and must not be overlooked in any purification scheme. It would seem to be an absurdity to expend large sums of money on a scheme for purification, and to make no provision to cut off the pollution at its source. There will be no current created in the 300-foot channel such as can be relied on to carry away foul matters. The filth from the Distillery Byres, if allowed to flow into the Bay as at present, will create almost the same trouble in the future as in the past. To get rid of this and other sewage will require expensive sewage works, and how is this expense to be met? Is it to be charged upon the property owners as a local improvement, or is any part of it to be borne by the City? I bring this matter before the attention of the Committee, as it seems to me to form one of the most important questions of a purification scheme, and will certainly have to be dealt with when the work is practically undertaken.

Assuming that the work of construction is finished, there is next to be considered the question of maintenance and repairs It is quite apparent that all the piling and timber work will, in the course of years, require constant repairs and renewals, and that this will be a matter of considerable annual expense. It is, therefore, important to know on whom the burden of this expense will fall, and in the public interest to secure guarantees that these repairs and renewals will be efficiently carried out. By Col. Alexander's tender, the contractors undertake to maintain *for all time to come* all the works to the *south* and *west* of the 300 foot channel. (Tender, p. 7, sec 1.) But it may be that the company receives only a lease of the lands reclaimed and the lands covered with water, for a term of forty-five years, at the end of which period the whole extent, with all the works and improvements, reverts to the City. In that event, there would appear to be a probability of difficulty arising in endeavoring to get the company to continue the work of maintenance when the term of their lease has expired If they are to continue to maintain, after their interest in the land has ceased, it would seem necessary to exact from them some substantial guarantee to that effect; for it would be an unusual circumstance that a company should continue to exist for no other purpose than to expend money in maintaining works from which they have ceased to derive any revenue or benefit. In clause 10 of the tender (p. 3) the contractor undertakes to keep the work in good repair "during the term specified in the contract," and to give a sufficient bond to that effect;

but this may be taken to refer to the five-year term spoken of in clause 31. On the other hand, the company may, under the terms of their tender, at any time during the currency of the lease, upon giving six months' notice, purchase all the lands for the sum of $200,000. (Tender, p. 7, sec. 1.) In that case they would hold the lands in fee, and could sell them, and could ultimately sell the whole of them; in which event again the position would arise of a company being bound to continue to repair works in which they had ceased to have any interest. So long as the company holds the lands the City might be able to exact guarantees that the work of repair should be kept up, and in the event of sale this burden of repair should be transferred under stringent conditions to the purchaser, and always remain a condition attached to the land. And this maintenance and repair should extend, under some general system of charge, upon all the reclaimed lands, to the maintenance of such works as the harbor entrance at the east, the lake protection at the south, the swing bridges, etc., which, though required for the general good and use of the whole extent, do not pertain specially to any particular part of the property. From the wording of the tender (sec. 1, p. 7) it seems doubtful if Col. Alexander includes the harbor works at the east end of the 300-foot channel, or the swing bridges, in his offer to maintain for all time to come; and if his company is not to maintain them, it is important to know who is. All this question of repair implies supervision and directive authority over the company, or its assigns, and should be very carefully dealt with, and clearly stipulated, in any contract or agreement between the company and the City. The promise "to maintain for all time to come" is easily made on the part of the company, but to ensure the due fulfilment of this under a lease or sale of the lands is a more difficult matter; and yet it is a matter of great importance that the City should clearly understand at the outset whether or not this burden of maintenance is in future to become a charge upon the City at large. Maintenance must also be held to include the dredging out of channels and harbor entrance as often as required.

But the offer to maintain for all time to come applies only to works lying south and west of the 300-foot channel, and does not apply to this cut or to the piling, etc., on the north side thereof. The repair of this is by clause 31, on p. 5 of the tender, to be done at the contractors' expense only for five years from the date of the completion and acceptance thereof, after which time the contractors' responsibility in the matter is apparently to cease, and the burden of repair is to fall elsewhere. It is important that the City should understand beforehand who is to bear this burden of repair; whether it is the property owners who bear the initial cost of the work, or the City. The expense of keeping the 300-foot channel properly dredged out will of itself be an important item.

In regard to the streets to be laid out by the contractors on the reclaimed lands, the mutual rights and duties of the contractors and the City should be clearly defined. I presume that all streets laid out will be subject to the same rules, regulations and by-laws as are applicable to all other streets in the City; that they will be dedicated to the City free of cost, that they will be paved and sewered, supplied with water and kept in repair on the same terms as other streets in the City; and if paved or sewered on the local improvement plan, it should be clearly set forth in the agreement between the City and the Company

that immunity from taxation does not imply immunity from local improvement rates or water rates. Also, it should be clearly stipulated that all existing contracts which the City has made with Corporations or Companies granting rights and privileges in respect of gas, electricity or street cars over or in streets within the limits of the Corporation must extend to and embrace all streets to be laid out in the reclaimed lands of Ashbridge's Bay.

Clause 8 on page 3 of the tender, which describes the exemption from taxation to be granted to the contractors by the City is one which requires some elucidation. All buildings and other erections, with plant, machinery, etc., are to be exempt from taxation for a period of ten years from the *date of erection*. This, it will be seen, is a perpetual clause granting exemption to every new building for ten years from its erection. If an old building is burnt down and a new one erected in its place does the exemption apply to the new building so erected? If so it would be easy for the dwellers on this reclaimed land to escape taxation continuously. The exemption claimed plainly includes dwelling houses. I direct the attention of the Committee to this clause so that the full scope of it may be enquired into. It is a clause of very great importance and any ambiguous wording should be avoided. In granting exemption the City should see clearly what it is granting and not leave it to be found out afterwards in some law suit.

The foregoing presents to the Committee some of the most important points —as I view them—of the Alexander scheme. There are no engineering difficulties pure and simple in the way of executing the works. The chief difficulty lies in the vast extent of the works, and the Company that undertakes them will have to be well provided with money in order to carry them to a successful conclusion in the time mentioned, ten years. The total value of the works comprised in the whole scheme, at a fair rate of cost, is about $5,000,000. The total amount of material required to fill in the reclaimed lands is about 2),000,000 cubic yards, and there are about 15 miles of pile breastwork or cribbing to be done. These are stupendous figures. The dredging of the Bay will have to be carried to 30 feet depth in order to provide material for the filling in, and even then there will remain about 3,000,000 cubic yards to be obtained elsewhere. I mention these facts so that the Committee may see that it is no small matter that is involved in this scheme, and to ensure the proper doing of it, large funds will be required, and stringent guarantees to protect the City's interests. It must be borne in mind that the only pecuniary benefit that the City obtains from this scheme is a deferred right of taxation on the reclaimed lands. The $10,000 per annum rental, which Col. Alexander agrees to pay, or the lump sum of $200,000 goes to the Local Government.

I trust that this report may aid the Committee in arriving at a conclusion as to the value to the City of the tender now before it.

All of which is respectfully submitted.

GRANVILLE C. CUNINGHAM,
City Engineer.

City Engineer's Office, City Hall,
Toronto, 21st December, 1891.

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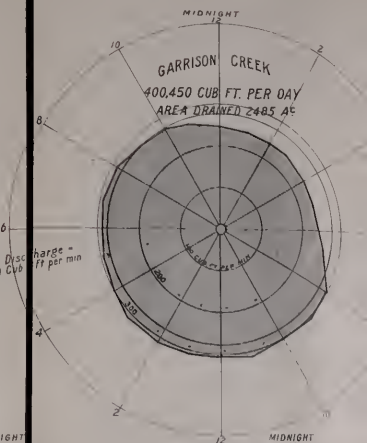
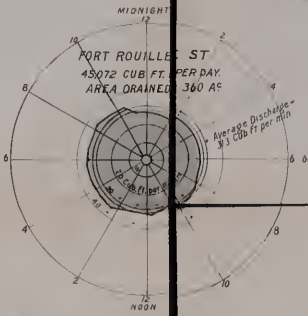
DIAGRAMS SHEWING
DISCHARGE OF TORONTO SEWERS
THROUGHOUT THE 24 HOURS — GAUGINGS MADE IN SPRING OF 1891

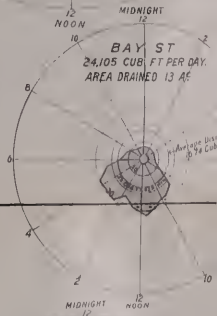
TABLE OF SEWAGE DISCHARGE.

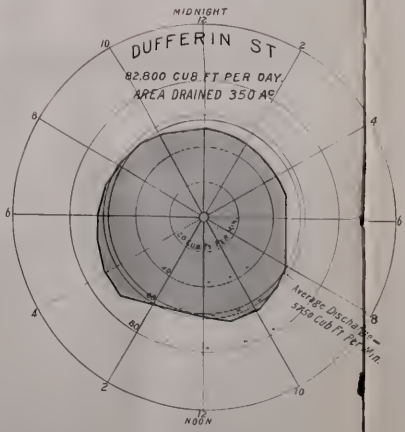
LOCATION OF SEWER	Size of Sewer	Area Drained above Weir	Number of persons per Acre	Population	Discharge in Cub ft per minute	Cub ft per Ac per min	Cub ft per Head per Day	Cub Ft. PER DAY	REMARKS.
GARRISON CREEK	7'6" diam	2485	15·7	39,014	27809	·11	10·27	400,450	
YONGE ST	3'6"x5'0"	372	46·2	17,186	21228	·57	17·78	305,683	Population estimated from Assesment of 1890 & Census Returns of 1891
FORT ROUILLE ST.	3'9"x2'6"	360	8·8	3,168	3130	·09	11·07	45,072	
BAY ST	2'0"x3'0"	13	440	572	1674	1·29	42·14	24105	
SHERBOURNE ST	2'6"x5'0"	101	45·5	4,595	3265	·32	10·23	47,016	
BERKELEY ST	2'0"x3'0"	25	41·8	1,045	1089	·43	15·00	15,682	
DUFFERIN ST	3'9"x2'6"	350	17·6	6,160	5750	·16	1344	82,800	
BATHURST ST	3'9"x2'6"	263	42·3	11,125	7156	·27	9·26	103,046	
CHURCH ST	2'8"x4'0"	160	39·8	6,368	6720	42	1519	96,768	
JARVIS ST	3'6"x5'0"	195	42·4	8,268	6262	·32	10·90	90,168	
ROSEDALE CREEK	66" diam	740	11·8	8,732	8225	·11	13·56	118,440	
PARLIAMENT ST	3'6"x5'0"	225	43·7	9,832	8083	·36	11·84	116,395	
CHERRY ST	2'8"x4'0"	271	41·7	11,300	7094	·26	904	102,153	
QUEEN ST E	2'4"x3'6"	770	9·4	7,238	7057	·09	14·04	101,616	"Eastern Ave, "Carlaw Ave etc" and Smaller Drains & portions below Weirs" are estimated from those above.
BROCK ST	4'0"x5'6"	311	45·7	14,213	11710	·38	11·86	168624	
SIMCOE ST	4'3" diam.	503	38·3	19,265	9378	·19	7·02	135,043	
EASTERERN AVE.	2'0"x3'0"	53	22·0	1,166	883	·17	10·91	12,720	
CARLAW AVE ETC	18"	80	130	1,040	800	·10	11·08	11,520	This includes Blong, Lagoon, Morse & Heward Ave Sewers
SMALLER DRAINS & PORTIONS BELOW WEIRS	VARIOUS SIZES	550	31·2	10,933	12050	·35	[illegible]	173,600	
AVERAGES			24·9			205	[illegible]		
TOTALS		7277		181,220	149340			2,150,[illegible]	

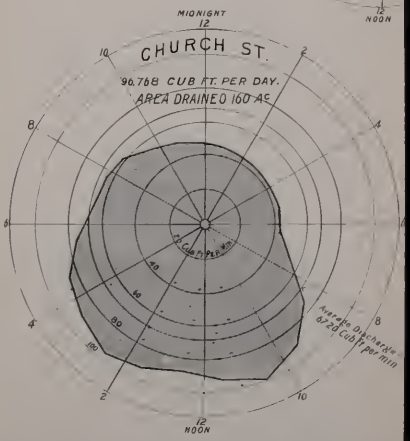
NOTE. — GARRISON CREEK AND YONGE ST DIAGRAMS ARE ON A DIFFERENT SCALE FROM THOSE BELOW.

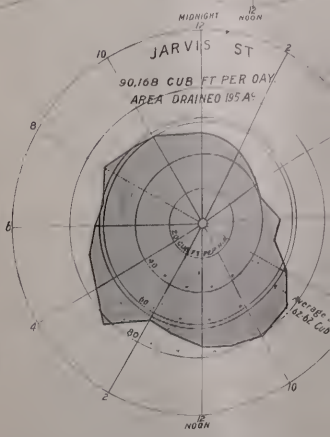




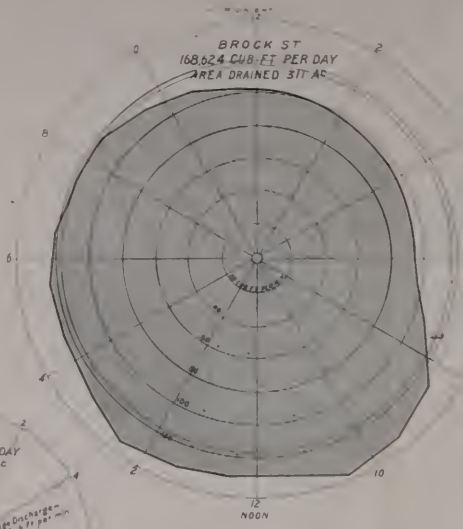


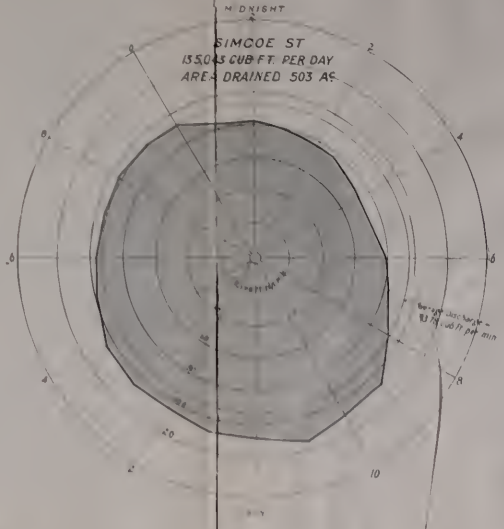


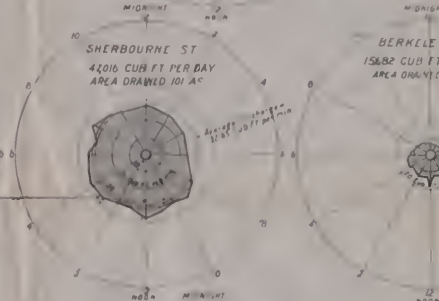




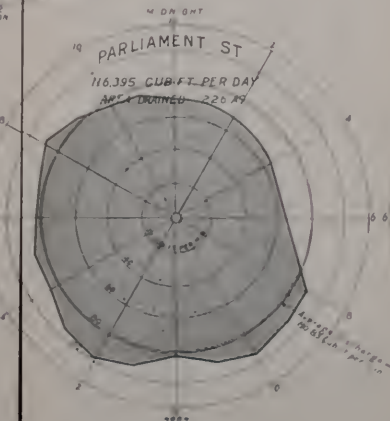
Alexander & Cable Lith Co Ltd Toronto

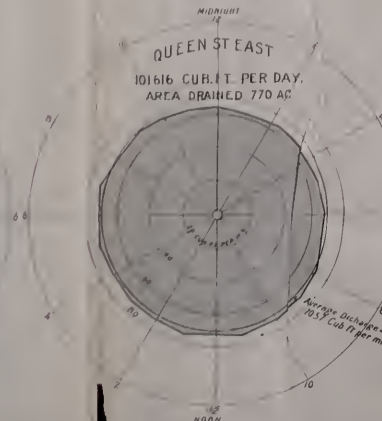






Edwards C. Cunningham
City Engr





CITY ENGINEER'S OFFICE
TORONTO

TORONTO WATER WORKS

ANNUAL REPORT

OF THE

SUPERINTENDENT

FOR THE

Year Ending 31st December

1891

TORONTO:
J. Y. Reid, Corporation Printer, 73 to 81 Adelaide Street West.
1892.

WATER WORKS DEPARTMENT

Committee, 1891:

ALDERMAN HILL, Chairman.
" GOWANLOCK.
" KERR.
" ALLEN.
" McMURRICH.
" BOUSTEAD.
" ROSE.
" PAPE.
" LINDSEY.
" LESLIE.
" PHILLIPS.
" BAILEY.
" PARK.

Financial Department:

R. T. COADY, City Treasurer.

Superintendent:

WM. HAMILTON.

Engineering Department:

W. C. BROUGH, A.M. Can. Soc. C.E.

Pumping Stations:

Main Pumping Station, - - W. BAXTER, Engineer-in-Charge.
High Level Pumping Station, - CHAS. HEAL, " "

Secretary to Department:

CHARLES A. MATTHEWS.

Telephone Numbers:

Superintendent's Office,	281
" " House,	568
Main Pumping Station,	380
Engineer W. Baxter's House,	1805
High Level Pumping Station,	3542
Press House and Stores,	1913
E. Foley, Foreman Pipe Laying and House Services,	1554
Rose Hill Reservoir,	3021
Northern Branch Office,	3538
Western " "	5309
Eastern " "	2528

ANNUAL REPORT

OF THE

TORONTO WATER WORKS

FOR THE YEAR ENDING DECEMBER 31ST, 1891.

SUPERINTENDENT'S REPORT.

To His Worship the Mayor and Members of the City Council—
Toronto, Ont.

GENTLEMEN,—In accordance with the requirements of the Water Works By-law, I beg to submit my annual report.

WATER SUPPLY.

The questions of increased Water Supply and additional Pumping Plant, advocated and adopted by the Committee and Council of former years, have been carried out in part.

The new conduit across the bay and the extension of the present conduit further into the lake have been in use for some time and fully demonstrated the advisability and necessity of this work, as we have had an ample supply of first-class cool pure water in the Engine House Well at all times. Analyses of the water supplied were made at frequent intervals, and the result always proved that the citizens were furnished with first-class water.

DISTRIBUTION.

The companion 12-inch mains recommended on Yonge, Queen and King streets before any permanent roadway is put down on these streets, have not yet been ordered to be laid. This question will have to be taken up shortly for several reasons. In the first place it adds to the life of the roadway, because there would not be any necessity to tear up the street either to put down services or repair bursts, and in the second place these mains will be required owing to the large amount of water used for hoists and manufacturing purposes, to give

increased supply and thereby to keep up the pressure for fire and other purposes.

The question of connecting all the dead ends of the various mains throughout the City will also have to be taken up. The connections will give a better circulation and thereby lessen the chances for dirty or stagnant water to accumulate, as the mains could then be more easily flushed out. The flushing of the mains should be done at least twice each year.

MAIN PUMPING STATION.

The plant at the Main Pumping Station has been kept in good repair during the year, and has done fairly good work: but so soon as the new pumping engine which was ordered by last year's council is in operation, it will be necessary to renew the pump plungers of No. 3 engine as well as to make general repairs to No. 1 Worthington pump.

The new engine house buildings and the foundation for the new engine are about complete and will be ready as soon as required for the erection of the plant. The steel well is in its place and connected to the supply pipe for the 36 inch conduit and old well.

I would strongly urge the necessity for another ten million high duty engine to be placed alongside the one we are at present erecting. The building is made large enough for that purpose and a full saving of coal and labour cannot be made until that is done. The new high duty plant would then supply the city, when the necessary repairs could be made in the old plant.

HIGH LEVEL STATION.

The pumping plant at this station has been working very satisfactorily since it was accepted; a pressure of 60 pounds being ordinarily carried in that part of the city lying north of College Street. This pressure can be increased at once in case of fire to 80 or 90 pounds.

ST. ALBAN'S PUMPING PLANT.

This station has been shut down since my last report, and the section of the city formerly supplied from this source is now supplied from the main pumping station.

STORE HOUSE AND MACHINE SHOP.

This department is in good order and supplied with an assortment

of all the materials required in the care and maintenance of mains, services and meters. A proper account of all goods received and delivered is kept. Goods are only delivered upon proper orders and are then charged to the different work, and a detailed statement of the same is sent to the head office:

VALVES AND HYDRANTS.

These are all in good order and regularly examined, and if found out of order repaired at once.

METER DEPARTMENT.

In the Meter Department all meters are examined, tested, and placed as required upon the different services. These are regularly read once each month and a memo. given to the consumer, who can then know how much water he is using, or if there is any waste going on. Meters are of very great service in detecting leaks and thereby saving water.

The manufacture of 6 inch valves has been carried on in this department, and I am satisfied it would be in the interest of the city to manufacture all brass work and small valves used.

The blacksmith's shop has been a valuable addition to the department doing a quantity of new work and all the general repairs required at the pumping station.

RESERVOIRS.

These grounds are in the same state as reported last year and have been very extensively used as a park or place of recreation by a large number of the citizens. An expenditure will be required next year for the completion of the drive to the south-east corner of the grounds and placing a set of stone steps at the northern and southern slopes leading to the reservoir.

LOMBARD STREET.

This branch of the service has given great satisfaction during the year just past. A telephone is placed in the building and all orders for bursts, etc. are attended to at once, thereby preventing any large amount of damages to goods, etc., as well as saving water.

The putting in of all new services and repairs to mains and services are managed from this office.

BRANCH OFFICES.

The following branch offices have been in operation for some time and have proved great assistance and benefit to citizens living in the outskirts of the city, viz:

Western Branch Office, on Dundas Street near Queen.
Northern " St. Paul's Hall, Yonge Street.
Eastern " No. 740 Queen Street East.

The water takers in these localities are not compelled to give their orders or pay their water rates at these offices, but have the option of doing so, either there or at the main office.

Registration of births are also made at these offices.

REDUCTION OF RATES.

This question will be again taken up by the Water Works Committee, and should be settled at once. The water rates in this City compared with the rates of other Cities on the Continent are low, when it is taken into consideration that the water is pumped against a pressure of 90 pounds, thereby dispensing with the necessity for steam fire engines to extinguish fires as well as supplying power to all the elevators and hoists in the City.

ACCOUNT.

A detailed account of the work performed during the year as well as comparative statements will be found in another portion of this report.

All of which are respectfully submitted.

WM. HAMILTON,
Superintendent.

ENGINEER'S REPORT.

TORONTO, January 1st, 1892.

WM. HAMILTON, ESQ.,

Superintendent Water Works Department.

DEAR SIR,—I beg to submit the following report of the works carried on under my directions during 1891, and the progress made therewith.

NEW CONDUIT.

(Report continued from 1890.)

Work was again resumed on the 16th April, 1891, by Mr. F. B. McNamee, dredging rock for the pipe cribs and placing cribs, during which time the department was having all the joints of the 5 foot portion of the conduit re-examined prior to being covered with sand.

On the 22nd April the diver, John White, reported that the flange joint between pipes 27 and 28 was broken (profile report of 1890) and consequently immediate steps were taken to repair it, which was done by the evening of May 8th, 1891.

A public test was made on the 13th and private tests on the 15th and 16th, by Mr. Fensom, Mr. Clark and myself, the results of which shewed that the 48-inch portion was quite tight, but that there was a leak either in the 5-foot portion or in the connecting-crib to the amount of one-half of one per cent. of the water supplied the pumps.

Subsequently some of the sheeting in the crib was found to have sprung, which at once accounted for the whole of the leakage.

Although the conduit was not satisfactorily completed, the department deemed it necessary to take possession thereof on the evening of Saturday, May 16th, 1891, as the old pipe could not supply the quantity or quality of water required.

The refilling of the trench with sand was satisfactorily completed by June 13th, 1891.

According to agreement, the connection between the old 36 inch cast-iron pipe and the new connecting crib was taken out of the contractor's hands and was undertaken by the Department.

The Department merely disconnected the old 36-inch and 48-inch pipes, placing a head over the mouth of the 36-inch so as to entirely lose off the old wooden pipe, which is now abandoned.

The connection is not yet completed, the delay being made in order that the valves on the 36 inch pipe, in connection with the new pumping plant, may be placed first.

There was another attempt made on the 4th August, 1891, to test the conduit, but there being comparatively little water in the reservoir, and the shutting off of the pumps reducing the pressure so much through the city the test was postponed.

LAKE EXTENSION.

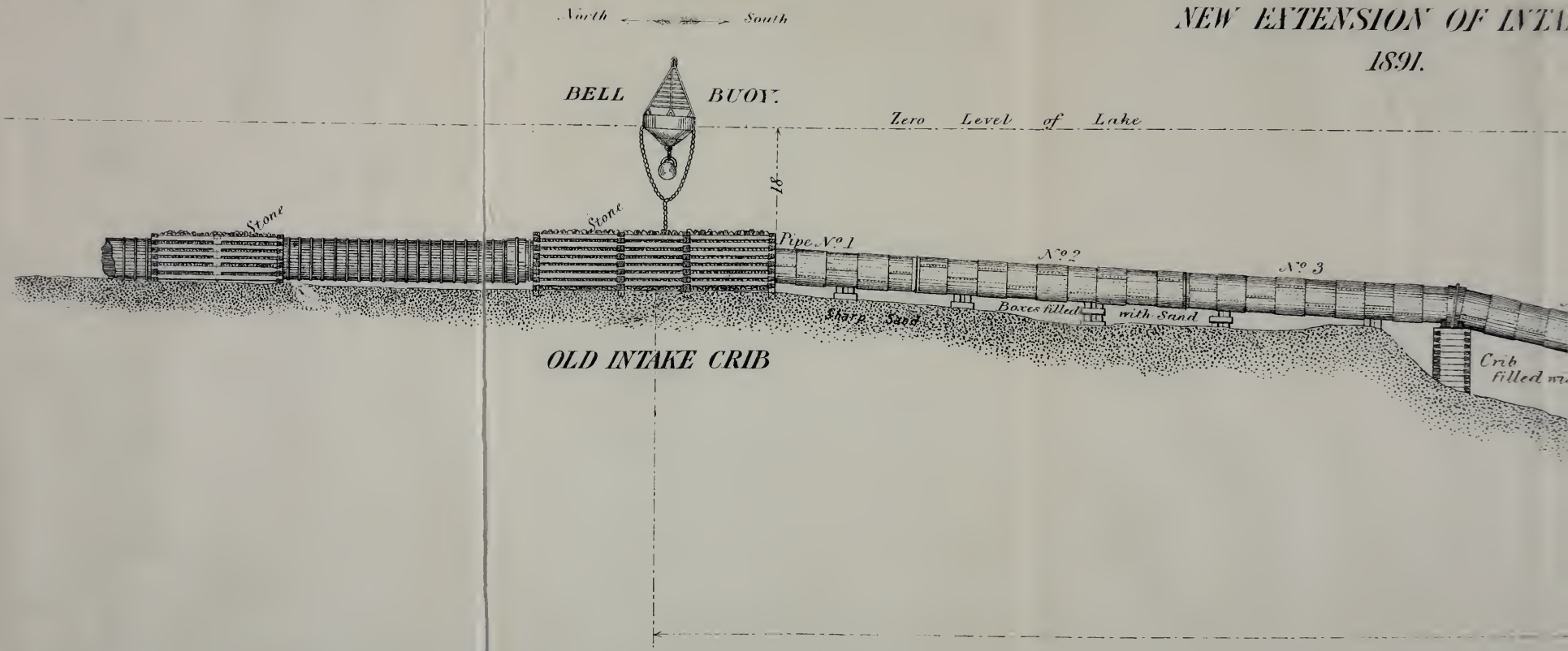
(Report continued from 1890.)

Work on "The Lake Extension" was resumed on Monday, May the 18th, 1891.

Boxes for blocking pipes, and sand for filling these boxes were procured and the men started out on the lake, to where the two pipes had been left the previous fall. These two pipes were found to have worked into the sand at the bottom of the lake, and to be filled with the same material, to the depth of about a foot. The great power required to raise these pipes caused the 1¼-inch hemp lines to break, which necessitated the procuring of wire cables. On account of this mishap, and the weather, the first pipe was not completed until the morning of May the 27th, and by the same evening the second pipe was also completed. The third pipe was finished on the 29th. The fourth pipe was lowered on the 3rd of June and joined by the 6th, but when the time came to secure the sleeve joint, it was discovered to have slipped off while launching the pipe at the dock; consequently the pipe had to be disconnected, in order to slip the sleeve on, and was not rejoined until the 10th.

The 5th pipe was completed on June the 12th, 1891.
" 6 " " " 13 "
" 7 " " " 16 "

The 8th pipe, or last, which was 30 feet long, was fastened to a short length in the crib, when it and the crib were taken out to position on the 22nd, and sunk and completed by the 25th. The remainder of the stone to secure the crib was deposited on the afternoon of the 26th. Next day the divers started to re-examine all the joints and to tighten the sleeve between the third and fourth pipes. On the 2nd of July the first joint was discovered to be broken, which delayed the full completion of the work until July the 9th, 1891.



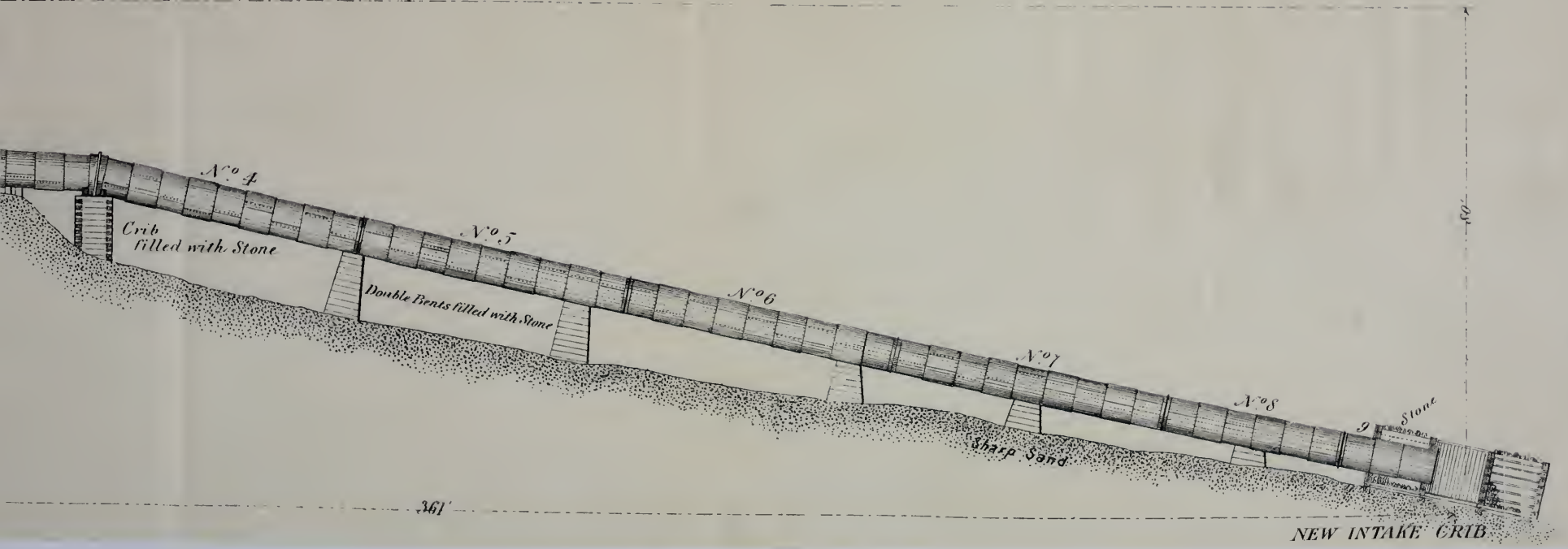
NEW EXTENSION OF INTA

1891.

SION OF INTAKE.

1891.

Scale 20' to an inch



The original estimate for the whole work, including pipe, was $10,000, of which the pipe, a little over 363 feet in length, cost $5,803.73, and therefore if the tender for laying, as stated in last years report, had been accepted, the work would have cost $15,803.73.

The actual cost has been $9,464.60 or a saving of $535.40 on the estimate, and $6,339.13 by day labor instead of contract, besides the diving pumps, blocks, etc., etc., now in possession of the Department and ready for future use.

To Mr. William Carson, foreman in charge of this work, is due a great deal of credit, for the expeditious manner with which the work was carried on.

STAND PIPE.

(Report continued from 1890.)

In last year's report I mentioned that the only work done on the stand pipe contract, up to the 31st December, 1890, was the building of the foundation, and placing of anchor bolts.

Although the contract was let on the 6th of May, 1890, and was to have been completed four months later, it was not finished until the 1st of August, 1891, because the contractors were delayed on account of their establishment in Montreal being burned, and there being no immediate hurry for its erection, the Department did not take advantage of the powers given it under the contract.

The stand pipe was built in order to give extra head to pump against, for the high level system, as the reservoir of this district is only about one hundred feet higher than the pumps, and as part of the district to be supplied is on the same level. It was considered that by means of the stand pipe only could a constant and even pressure be kept up with satisfaction without danger arising from frequent hydraulic shocks. The pipe equalizes the resistance against the pumps, and serves as a practical substitute for a relief valve or cushion.

The pipe is one hundred feet high and six feet in diameter, having internal force and over-flow pipes, with a discharge at the bottom. It is built of mild steel of uniform character, varying in thickness every 20 feet of height, from $\frac{5}{8}$ to $\frac{1}{4}$ inch. The drawings hereto attached will give a good general idea of the structure.

In taking into consideratian the style of construction, the internal force main will always be full on account of a check-valve being so arranged as to close the moment the pumps slacken speed, and wil also cause a circulation to prevent freezing.

DETAILS OF STAND PIPE.

The stand pipe holds 18,235 imperial gallons, or about 85 tons. The foundation consists of, approximately, 58 cubic yards, weighing about 107 tons. The iron work of stand pipe weighs 20¼ tons, making a total weight of 212¼ tons, which rests in a stiff red clay.

There are four guy-rods 1¼ inch in diameter, reaching 75 feet up from base, and 25 feet out therefrom, secured at the bottom by running through stones 4 feet by 3 feet by 1 foot, buried 6 feet under the surface. The original estimated cost was $3,145.70, and the contract price was $3,140, but on account of some extra depth of foundation, and other small alterations in details, the stand pipe proper amounted to about $3,262.

N. B.—As several new residences have been erected in close proximity to the stand pipe, it was deemed expedient, for the moral effect, in order not to depreciate the value of the surrounding property to place four more guys of ⅝ inch steel cable.

NEW PUMP HOUSE AND PLANT.

Tenders were received during 1890 for a 10,000,000 imperial gallons pumping engine as a substitute for and to be placed in position of the 4,000,000 gallons Worthington pump known as No. 1; but, on re-consideration, it was thought that it would be an advantage not to disturb No. 1, but to build a new pumping house and place a new pump therein.

Accordingly tenders were called for and contracts awarded as follows:

To "The Geo. F. Blake Manufacturing Co.," of Boston, Mass., on April 22nd, 1891, for a direct acting cross-compound fly wheel condensing pumping engine, with a capacity of 10,000,000 imperial gallons and a duty of 110,000,000 foot pounds, and four boilers.

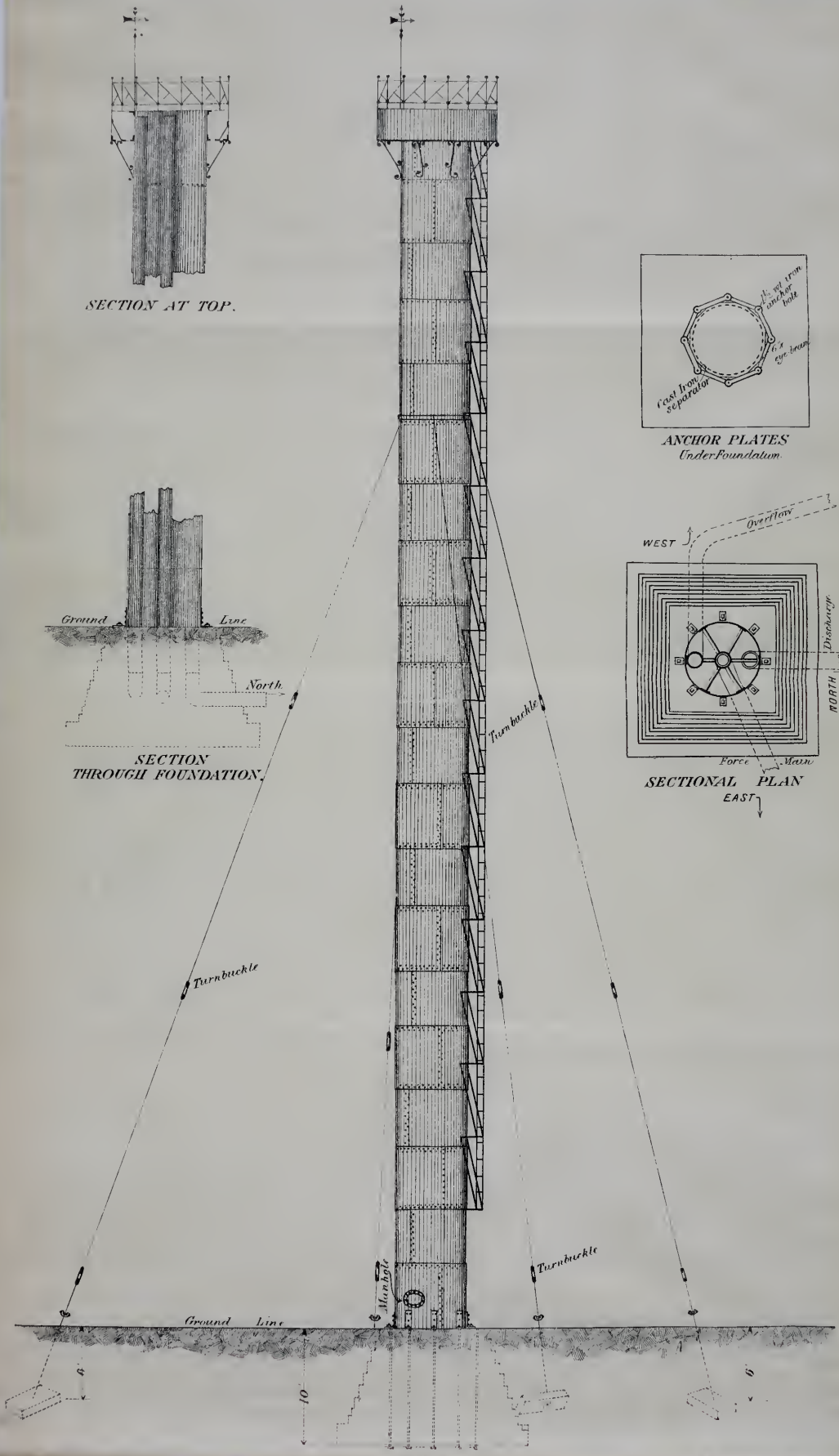
To Barnabas Gibsen, Esq., for the construction of the sub-foundations of the new buildings and the connection of old conduit pipe with the new well, and all coffer-damming, etc., blasting and excava-

SECTION AT TOP.

ANCHOR PLATES
Under Foundation.

SECTION THROUGH FOUNDATION.

SECTIONAL PLAN



STANDPIPE.

Scale 1/8" = 1 foot

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tion found necessary, therewith. The foundations are at an average of 15½ feet deep and 10 feet below zero water level of the Bay and are built on the rock.

The tank for the well and the special pipes for the connections are supplied by the Polson Iron Works Co., of Toronto.

The tank is of ⅜-inch steel, 38 feet long by 8 feet wide, and 18 feet high, with a division in centre, so that either end may be used or shut off for cleaning at will.

The contract for the superstructure of buildings and chimney was awarded to Newman Brothers, on the 15th September, 1891.

All the above works have been delayed beyond the contract time: but, considering the difficulties to be contended with, fair progress has been made, and there is every expectation of having the new pumps in operation towards the end of June, 1892.

The buildings and foundations were prepared for the reception of a double plant, and, it is evident by placing a second new pump, a great saving of coal (about 50 per cent.) would be attained, besides having a sufficient plant in case of accident. It will not be out of place here to mention that Toronto has been the poorest supplied City on the continent in the way of a sufficient pumping plant.

In speaking of water-supply I consider there would be a great advantage gained in connecting the 24-inch main at the corner of College and University Streets by a 20-inch main to the present 20-inch main on Macpherson Avenue and Avenue Road, and extending the 20-inch main from Yonge Street and McPherson Avenue up to the Reservoir, in order to gain free passage to and from the Reservoir, thereby increasing the pressure when the pumps are shut down and relieving them when they are working.

Finally, as to supply, I would strongly recommend the Council to have a thorough investigation of the gravitation system made, either from Lake Simcoe or Artesian wells.

It has been demonstrated by the Corporation of North Toronto, that a partial supply can be procured from Artesian wells, which, no doubt, would greatly augment the present supply and also give sufficient fire pressure above the line of Cottingham Street and only necessitate the laying of a small main.

GENERAL REPORT.

During August the Island crib which had become very much out of repair, was re-sheeted and floored. The pine wood both above and below water mark was quite sound, but the oak sheeting where alternately wet and dry had decayed.

A portion of the "Old Filtering Basin" in which the Island crib was situated has been filled, thereby doing away with the stagnant water, which surrounded the crib and part of the intake pipe.

The 16-inch suction pipe for St. Alban's Station was repaired during the early part of the year, and that portion of the pipe inside the piling which was exposed to the danger of freezing, on account of the lowness of the water has been covered with sand.

The method of crossing the Don River by means of a 12-inch steel pipe, suspended from the bridge has proved a great success.

Although we have had excessively cold weather no trouble has been experienced from frost, and therefore there has been no occasion to close this pipe off with valves, as at first was thought probable would be necessary.

The mains, valves and hydrants placed during the year, have been measured and plotted.

I am pleased to be able to report that I consider the records in the Atlas now to be full and reliable.

There have been twenty separate and distinct specifications with their necessary accompanying drawings, prepared during the year, also the drawings hereto attached, giving the final details of construction of the lake extension, stand pipe and Don crossing.

The records of the pumping stations, reservoirs, etc., have been worked out for the schedules hereto annexed.

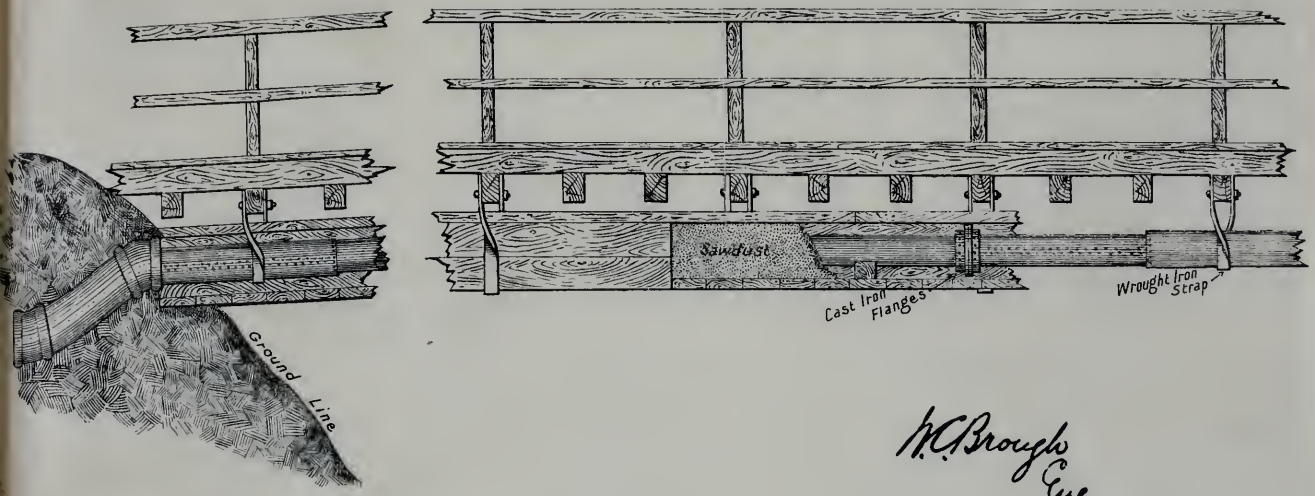
There has been an unusual number of details to be looked after during the year, amongst which was the trouble caused by weeds coming through the conduit. I account for this trouble by the lowness of the water in the lake, leaving the tops of the sea-weed in Humber Bay exposed to the violence of the south-west winds, during which winds only, is the trouble experienced.

All of which I respectfully submit,

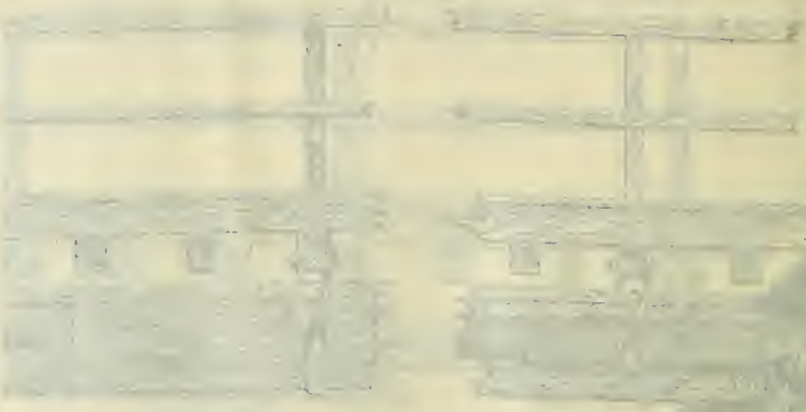
WALTER C. BROUGH,
A.M. Can. Soc. C.E.

12" STEEL MAIN OVER DON AT EASTERN AVE.

Scale 4ft. to an Inch.



H.C. Brough C.E.



REPORT OF ENGINEER AT MAIN PUMPING STATION.

MAIN PUMPING STATION,
January 1st, 1892.

WM. HAMILTON, ESQ.,
Superintendent Toronto Water Works.

SIR,—I beg to make the following report in reference to the Main Pumping Station:

On account of the illness of the late Mr. John C. Ferguson, who was granted leave of absence, I was temporarily placed in charge on the 23rd of April, 1891, and remained in that position until the 3rd of September of same year, upon which date I was appointed by the City Council to my present position as Engineer in charge of this Station.

During the past year nothing of marked importance has occurred.

The three pumping engines have undergone a few general repairs, and by careful attention were kept running almost constantly, as will be seen in the record book.

In consulting the book referred to, it must be borne in mind that the pumping engines are old, without recent improvements, and of a low-duty type, and therefore cannot be expected to show as good a record as the new styles of engines now in vogue.

Great benefits will be experienced in the saving of fuel and general running expenses when the erection of the new 10,000,000-gallon engine, now under course of construction, is completed, and I would strongly advise the erection of still another new one of high-duty type, when a saving of over fifty per cent. of the present consumption of coal would be effected.

Furthermore, should these new pumps be placed, we would then have sufficient time at our disposal to overhaul, repair, and alter the present plant, so that this City might compare favorably with other cities of its size in the way of pumping capacity.

The amount of water pumped and coal consumed, etc., has been submitted to Mr. Brough's office for computation, and is generally seen in Schedule No. 2.

All of which I beg to submit.

WM. BAXTER,
Engineer in Charge.

REPORT OF ENGINEER AT HIGH LEVEL PUMPING STATION.

HIGH LEVEL STATION,
Jannary 21st, 1892.

TO WM. HAMILTON, ESQ.,
Superintendent Toronto Water Works:

DEAR SIR,—I beg to submit the annual report of the performance and condition of the plant over which I have charge.

The engines and pumps were guaranteed to pump 3,000,009 imperial gallons per day, with a plunger speed of 250 feet per minute and to develop a commercial duty of 100,000,000 foot pounds per 100 lbs of coal consumed.

Exceptions were taken by many practical engineers to the high speed at which it was proposed to run pumps (250 feet per minute), and various predictions were made that there would be a collapse of the machinery and of the building containing it, on account of the excessive vibration resulting from such a high speed. I am pleased to say these predictions have not been verified.

During the year I suggested improvements which were carried out by the Contractors, and made adjustments by which a speed of 80 revolutions per minute has been accomplished, and this without shock or undue vibration; in fact, so slight is the vibration, that an ordinary one-cent piece will stand upon its edge on the pedestals or pumps while engine is running at above speed, and under the ordinary daily working conditions of 120 lbs. steam, and 60 to 70 lbs. water pressure on the force main.

The capacity of the pumps in 24 hours at contract speed (50 revolutions) is 3,427,376 imperial gallons, or 14.2 per cent. over the guarantee, while at 80 revolutions the capacity is 5,483,802 imperial gallons, or 82.7 per cent. over the guaranteed capacity, and this has been easily attained by these engines.

Any defects which have developed have been attended to by the Contractors, and at present they are making some slight repairs that they deem may be necessary before finally passing them over to the City. I would add that no defect or breakage has occurred which has in any way disabled the engines or pumps.

The boilers are clean and in first-class condition, and have shown no defect or weakness, or required any repairing during the year.

The air and feed pumps and all auxiliaries are in good condition.

Large quantities of sand commenced to pass through the pumps early in the year, and this has continued in varying amounts up to the present time. It has done some injury to rods, plungers, valves and seats.

The plant as a whole is in good working condition, and in point of economy ranks with the highest duty pumping engines.

The actual duty cannot be easily estimaed, for although the engines are only run an average of fifteen hours per day, they have always to be kept in readiness in case of fire; the boilers being under steam at an average pressure of 100 lbs. during the night.

The commercial duty (the ordinary daily working conditions without deductions or allowances of any kind) is over 100,000,000 foot pounds per 100 lbs. of coal consumed for all purposes; this includes coal used for raising steam and banking fires, also the heating of engine room, workshop, and Engineer's dwelling with steam from main boiler.

I submit data for capacity, duty and horse-power applicable to this plant, which if printed would be convenient for reference.

All repairs, additions and improvements to buildings, also running repairs to plant have been personally attended to as far as possible.

Respectfully submitted.

CHAS. HEAL.

REPORT OF GARDENER AT ROSE HILL RESERVOIR

Rose Hill Reservoir Park,
April 18th, 1892.

W. Hamilton, Esq.,
Superintendent Toronto Water Works :

Sir,—I beg to submit the following report of work done at Rose Hill Reservoir Park, High Level Reservoir, Main Pumping Station, and High Level Pumping Station, grounds.

IMPROVEMENTS.

Owing to the small appropriation the improvements were not as extensive as they should have been, and consisted of transplanting trees and shrubs, grading and sodding, extension of road, etc.

MAINTENANCE.

The principal items under this head are, pruning trees, planting and care of flower beds, mowing grass, cleaning walks, and necessary repairs made to steps connecting terraces in ravine, and to the dams in the creek.

MAIN PUMPING STATION GROUNDS.

The usual number of flowers were planted, grass mowed, and the same cared for during the season.

HIGH LEVEL PUMPING STATION.

The creek was cribbed on both sides, the grounds in front of house, graded and sodded, the fence on north side of property was partially replaced with new, and the remainder repaired.

HIGH LEVEL RESERVOIR.

The High Level Reservoir was cleaned out, fence repaired throughout the season the grass was cut and the walks cleaned

Respectfully submitted.

GEO. REEVES.

SCHEDULE No. 1.

STATEMENT OF REVENUE AND EXPENDITURE FOR THE YEAR 1891.

Revenue:			
Collected on account of 1891 in 1890			$54,269 82
Collected in 1891		$454,199 76	
Less collected on account of 1892	$58,446 61		
Refunds	2,603 72		
		61,050 33	
			394,149 43
Revenue for 1891			$448,419 25
Expenditure:			
Working expenses, 1891	$225,513 77		
Less 1890 accounts provided for in 1890	16,493 78		
	$209,019 99		
Outstanding accounts, 31st Dec., 1891:			
Passed by Committee	$1,886 26		
Other accounts	700 00		
	2,586 26		
		$211,606 25	
Less Cr. coal carried forward	$19,733 38		
" stores carried forward	8,000 00		
" sundry receipts from sale of coal screenings, etc	1,018 75		
		$28,752 13	
		$182,854 12	
Interest and sinking fund		226,273 00	
			409,127 12
Surplus of Revenue over Expenditure			$39,137 13

SUMMARY OF MAINTENANCE.

	Paid.	Unpaid.
Meter and machine shop	$13,049 86	$58 32
Maintenance distribution	14,452 43	9 95
Inspection	9,752 00	.....
Salary of Superintendent	2,500 00	.....
Insurance and damage claims	456 75	25 00
Main Pumping Station	121,126 64	693 23
Rose Hill Reservoir	4,091 63	200 62
High Level Station	9,787 07	380 85
Press and Store House	5,885 46	107 75
Office	22,491 71	98 30
St. Alban's Station	8,287 22	92 59
Cartage	2,623 44	92 45
Miscellaneous	2,589 75	.....
General Stores	8,419 81	127 20
	$225,513 77	$1,886 26
	1,886 26	
	*$227,400 03	

(Less Cr. as per statement of Revenue and Expenditure, $28,752.13.)

DETAILS OF MAINTENANCE ACCOUNTS.

METER AND MACHINE SHOP:

Labor, as per pay sheets	$11,301 02
F. W. Unitt, general stores	45 20
Gall, Anderson & Co., lumber	50 84
Bryce Bros., lumber	41 16
Fox & Co., meter boxes	225 53
Matt. Warnock, blacksmith work	18 50
Wm. McGill & Co., coal	266 87
Rice Lewis & Son, hardware	10 60
Treloar, Blashford & Co., special castings	23 14
Canadian Express Co., expressage	1 00
McColl Bros. & Co., oil	21 25
Thomas Dean, bronze castings	84 22
Collector H. M. Customs, duty on meter parts	21 60
Grand Trunk Railway Co., freight on meter parts	2 55
H. R. Worthington, parts of meters	72 38
Reid & Co., lumber	36 89
W. K. Colville, cartage	7 50
Jas. Morrison, brass work	7 73
Carried forward	$12,237 98

(*This is inclusive of $16,493.78 outstanding accounts from 1890.)

Brought forward	$12,237 98	
Wilson & Cousins, brass work	20 30	
Transfer from general stores	791 58	
		$13,049 86

Outstanding accounts, December 31st, 1891, $58.32.

MAINTENANCE DISTRIBUTION:

Labor, as per pay sheets	$12,168 29	
St. Lawrence Foundry Co., castings	4 38	
Matt. Warnock, blacksmith work	28 75	
Warren, Scharf Asphalt Co., repairing pavement	42 51	
Burns & McCormack, gravel	17 52	
Robt. Elder, bob sleighs	34 00	
John Nicholson, oak chamber tops	166 25	
W. B. Malcolm, force pump, etc.,	23 50	
S. W. Hawkesworth, repairing service	2 03	
Bell Telephone Co., rent of telephone	50 00	
Wm. McGill & Co., coal	59 70	
Board of Works, repairing roadways	479 06	
Treloar, Blashford & Co., special castings	190 30	
F. H. Hyde, valves	54 00	
John Perkins, turning hydrant	8 50	
J. Bailey, repairing service	7 00	
Kemp Manufacturing Co., galvanizing screws	24 62	
John Abell, hire of engine	7 00	
John Maddocks, set of harness	25 00	
Jas. Morrison, remodelling gauge	10 65	
W. C. Brough, petty disbursements	2 00	
Thos. J. Clark, hire of tug	10 00	
Galloway, Taylor & Co., special castings	119 41	
D. L. Van Vlack, cedar blocks, etc	179 58	
Consumers Gas Co., gas	168 91	
Transfer from general stores	568 67	
J. M. St. Clair, blacksmith work	80	
		14,452 43

Accounts outstanding, December 31st, 1891, $9.95.

INSPECTION:

Labor, as per pay sheets	$9,738 00	
Kent Bros., badges	8 75	
W. J. Hammond, cap	5 25	
		9,752 00

SALARIES:

Wm. Hamilton, Superintendent	2,500 00
Carried forward	$39,754 29

Brought forward		$39,754 29
INSURANCE AND DAMAGE CLAIMS:		
Boiler Insurance and Inspection Co., insurance of boilers	$340 00	
Insurance on coal	88 00	
The Shedden Co., damage claim	20 00	
Sundry Insurance Companies, over payment on award *re* Press House fire	8 75	
		456 75
Outstanding accounts, December 31st, 1891, $25.00.		
GENERAL STORES:		
Stores brought forward from last year	8,500 00	
F. W. Unitt	2,693 24	
Rice Lewis & Son, iron and steel	675 43	
Thos. Dean, phosphor bronze	23 76	
McRae & Co., cement	11 65	
W. McGill & Co., coal	27 00	
Samuel Rogers & Co., oils	26 94	
Rice Lewis & Son, general stores	985 00	
	$12,943 02	
Material taken out of stores and charged to the Departments	4,523 21	
		8,419 81
Accounts outstanding, 31st December, 1891, $127.20.		
MAIN PUMPING STATION:		
Labor, as per pay sheets	$22,556 49	
F. W. Unitt, packing	65 84	
Doty Engine Co., engine repairs	771 00	
Wm. McGill & Co., coal	66,052 91	
Bryce Bros., lumber	82 27	
Rice Lewis & Son, hardware	79 33	
Garlock Packing Co., packing	84 03	
S. Rogers & Co., oils	460 87	
McColl Bros. & Co., oils	199 45	
Livingstone & Wright, repairing fire boxes	719 53	
Thomas Dean, phosphor bronze	273 07	
Gutta Percha and Rubber Manufacturing Co., rubber valves and packing	547 62	
John Fensom, boring and planing liners	280 65	
Chas. Smith & Co., engine repairs	108 65	
John Bickley, carting and screening coal	800 83	
John Sheppard, blue clay	12 00	
Bell Telephone Co., rent of telephone	85 00	
St. Lawrence Foundry Co., cast iron plunger	270 00	
Carried forward	$93,449 54	$48,630 85

Brought forward	$93,449 54	$48,630 85
Wm. Carson, boat	85 00	
Imperial Chemical Co., boiler compound	144 00	
Harbor Commissioners, storing buoys	100 00	
John Perkins, repairing boilers	89 78	
Treloar, Blashford & Co., special castings	15 36	
Coal Trade Journal, advertising	10 00	
Toronto Rubber Co., rubber boots	17 38	
Vacuum Oil Co., grease	7 59	
World Printing Co., advertising	9 00	
Buffalo Courier, advertising	6 00	
Mail Printing Co., advertising	9 00	
Globe Printing Co., advertising	9 00	
News Printing Co., advertising	7 00	
Jas. Morrison, testing gauges	2 40	
Polson Iron Works Co., machine work	219 54	
W. H. Ellis, analyzing coal	5 00	
Toronto Electric Light Co., supplies	134 83	
H. F. Hodson, flag staff	50 00	
Canadian Rubber Co., gaskets	5 85	
W. B. Malcolm, hydrant	4 00	
Reid & Co., lumber	15 87	
Dominion of Canada, testing scales	9 00	
Toronto Lime Co., lime	1 25	
Northey & Co., pump plungers	25 00	
Royal Oil Co., oils	340 80	
Galloway, Taylor & Co., special castings	17 00	
Collector H. M. Customs, duty	22 50	
Canadian Express Co., expressage	1 25	
S. P. Jones, recording gauge	63 75	
Wm. Hamilton, petty disbursements	2 75	
John Inglis & Son, engine repairs	7 05	
Coal brought forward from last year	25,103 30	
General stores	1,136 94	
		121,126 64

(Memo.—Less coal carried forward to 1892, $19,733.38.)

Accounts outstanding, December 31st, 1891. $693.23.

Rose Hill Reservoir:

Labor, as per pay sheets	$3,145 00	
F. W. Unitt, general stores	16 00	
Wm. McGill & Co., coal	413 94	
Toronto Lime Co., drain pipes	31 86	
S. E. Plowman, blacksmith work	3 90	
J. W. Knott, painting	6 00	
Carried forward	$3,616 70	$169,757 49

Brought forward	$3,616 70		$169,757 49
Bell Telephone Co., rent of telephone	50 00		
Jos. Moat, toll	21 40		
Bryce Bros., lumber	39 92		
J. A. Simmers, lawn mower, etc	61 60		
Britnell & Co., stone chips	60 00		
Jno. Davis & Son, flower pots	54 00		
Wm. Stollery, building culverts, etc	46 43		
McRae & Co., portland cement	3 25		
Reid & Co., lumber	7 85		
General stores	130 48		
			4,091 63

Accounts outstanding, December 31st, 1891, $200.62.

HIGH LEVEL STATION:

Labor, as per pay sheets	$4,558 51	
F. W. Unitt, general stores	16 60	
Rice Lewis & Son, hardware	71 02	
S. Rogers & Co., oils	39 45	
Wm. McGill & Co., coal	3,300 00	
Ontario Coal Co., coal	294 25	
Mrs. E. G. Woodley, rent of house	117 00	
Bryce Bros., lumber	34 82	
Bell Telephone Co., rent of telephone	50 00	
Kent Bros., clock	10 00	
Harry Webb, refreshments	90 00	
S. Meadows, gas fixtures	29 00	
Chas. Rogers & Sons Co., office furniture	26 20	
J. Ross Robertson, advertising	6 00	
Toronto Electric Light Co., lighting engine house	191 83	
Polson Iron Works Co., labor	24 30	
Canadian Rubber Co., gaskets	3 15	
Royal Oil Co., oils	44 20	
Wm. Stollery, pointing at high level reservoir	62 57	
D. Daniels, sod	31 40	
Reid & Co., lumber	93 81	
Wm. Hamilton, petty disbursements	1 00	
Consumers Gas Co., gas	100 00	
General stores	589 96	
J. Plowman, blacksmith work	2 00	
		9,787 07

Accounts outstanding, December 31st, 1891, $380.85.

PRESS AND STORE HOUSE:

Labor, as per pay sheets	$5,085 12	
F. W. Unitt, general stores	25 00	
Carried forward	$5,110 12	$183,636 19

Brought forward	$5,110 12	$183,636 19
Gall, Anderson & Co., lumber	95 23	
Rice, Lewis & Son, scales	134 10	
Toronto Rubber Co., rubber packing	13 06	
Wm. McGill & Co., coal	134 59	
W. D. Hutson, repairing roof	0	
Bell Telephone Co., rent of telephone	50 00	
St. Lawrence Foundry Co., castings	70	
Toronto Rubber Co., rubber boots	6 85	
Bryce Bros., lumber	3 88	
Thomas Dean, bronze castings	9 38	
Royal Oil Co., oils	21 00	
Reid & Co., lumber	3 01	
Wilson & Cousins, brass work	1 80	
Gurney Scale Co., adjusting scale	13 35	
Robert J. Wright, inspecting scale	3 00	
Consumers Gas Co., gas	100 00	
General stores	171 89	
		5,885 46

Accounts outstanding, 31st December 1891, $107.75.

OFFICE:

Salaries, as per pay sheets	$13,911 50	
Davis & Henderson, binding	4 00	
Parkdale Times, advertising	2 00	
E. Harris Co., colors	2 25	
Geo. F. Dow, rubber stamps, etc	24 50	
Empire Printing and Publishing Co., advertising	44 25	
Globe Printing Co., advertising	42 50	
Toronto Street Railway, car tickets	130 00	
John Mitchell, livery hire	153 25	
Toronto Coffee House Association, meals for employees	13 53	
John Clewes, globe heater	15 00	
J. Ross Robertson, advertising	43 30	
News Printing Co., advertising and rent	140 50	
J. S. Robertson, lamps	2 50	
Mrs. Hubertus, postage stamps	125 00	
Cyclostyle Co., paper, ink, etc.	19 62	
Samuel Young, carpenter work	13 82	
A. Morrow, cab hire	5 00	
J. McGrath, cab hire	5 00	
J. Townsend, cab hire	9 00	
Rice Lewis & Son, hardware	2 75	
Bell Telephone Co., rent of telephone	160 60	
Mail Printing Co., advertising	41 50	
Carried forward	$14,911 37	$189,521 65

Brought forward	$14,911 37	$189,521 65
Wm. McGill & Co., coal	29 10	
Newsome & Hough, lithographing	30 00	
John Maughan, premium on guarantee bonds	22 50	
World Printing Co., advertising	53 25	
E. H. Roberts, locks and keys	4 80	
P. Maher, cab hire	4 00	
H. S. Alexander & Son, painting signs, etc.	36 00	
Ontario Coal Co., coal	6 40	
Mrs. B. Fheely, cleaning western office	8 00	
Montreal Gazette, advertising	4 00	
C. H. Mortimer, advertising	11 20	
Chas. Rogers & Sons Co., office furniture	8 75	
P. C. Allan, Scientific American	8 50	
James Morrison, repairing pressure gauge	3 60	
J. J. Coulter, meals for employees	2 50	
Wm. Clow, meals for employees	16 75	
W. C. Brough, petty disbursements	6 85	
North Ender Publishing Co., advertising	64 00	
Ashcroft Manufacturing Co., register charts	5 25	
Collector H. M. Customs, duty on charts	1 50	
Geo. Hodgins, repairing clock	2 00	
Edward Gegg, bailiff's fees	3 00	
Wm. Hamilton, petty disbursements	3 75	
R. H. Saunderson, repairs at branch office	8 55	
Tingley and Stewart, repairing stamp	75	
Salaries revenue and collection branch	3,750 00	
Mights Directory Co., city directories	40 00	
Consumers Gas Co., gas	200 00	
London Guarantee and Accident Co., premiums	30 00	
John Y. Reid, printing	796 05	
Brown Bros., stationery	1,146 74	
Bain & Son, embossing	47 00	
General stores	45 05	
Expenses of submitting by-law	1,178 00	
Catherine Grifton, ribbon for stamp	2 50	
		22,491 71

Accounts outstanding, December 31st, 1891, $98.30.

St. Alban's Station :

Labor, as per pay sheets	$2,720 25	
McColl Bros. & Co., oils	68 50	
Wm. McGill & Co., coal	4,266 63	
Toronto Rubber Co., rubber packing	16 25	
Carried forward	$7,071 63	$212,013 36

Brought forward	$7,071 03	$212,013 36
St. Lawrence Foundry Co., castings	80 66	
John Cotts, slabs	108 75	
Chas. Smith & Co., engine repairs	94 84	
Samuel Hobbs, coal oil	2 85	
James Evoy, carting coal	389 94	
John Hanlan, hire of scow	13 50	
Alex. Coghill, repairing suction pipe	100 00	
Bell Telephone Co., rent of telephone	82 09	
Livingstone and Wright, repairing brickwork	168 09	
John Perkins, repairing boilers	4 95	
W. K. Colville, cartage	4 65	
Treloar, Blashford & Co., special castings	2 20	
Chas. Robinson, sanitary convenience	5 00	
H. F. Hodson, hire of scow	62 17	
E. Terry, fire clay	8 20	
Bryce Bros., lumber	52 92	
Empire Printing and Publishing Co., advertising	9 00	
Reid & Co., lumber	2 53	
General stores	23 25	
		8,287 22

Accounts outstanding, December 31st, 1891, $92.59.

CARTAGE:

Labor, as per pay sheets	797 63	
F. W. Unitt, general stores	5 75	
Gall, Anderson & Co., lumber	10 16	
P. McIntosh & Son, horse feed	775 32	
A. Smith, V.S., attendance	56 50	
James Kerr, horseshoeing	16 15	
Jas. M. Purvis, horse feed	520 88	
Wm. McGill & Co., coal and wood	21 62	
John Bethell, repairing wagons	76 50	
Robert Nicholls, repairing harness	21 70	
D. Rennie, horseshoeing	13 87	
J. M. St. Clair, horseshoeing	34 65	
W. E. Martin, horseshoeing	50 70	
John Maddocks, repairing harness	43 15	
Robert Elder, repairing wagons	48 25	
John Hickey, toll	6 60	
T. Walker, horseshoeing	12 00	
General stores	112 01	
		2,623 44

Accounts outstanding, 31st December, 1891, $92.45.

Carried forward	$222,924 02

Brought forward		$222,924 02
MISCELLANEOUS:		
Robert Bond, cab hire	$6 25	
W. H. Ellis, analyzing water	200 00	
Chas. Brown, cab hire	1 00	
John Kennedy, C.E., fee and expenses	230 00	
Property Committee, rental of lots	1,927 50	
Thos. Heys, analyzing water	225 00	
		2,589 75
		$225,513 77

SUMMARY OF CONSTRUCTION ACCOUNTS.

	Paid.	Unpaid.
Pipe laying	$79,136 54	$9 30
House services	32,916 62	.....
Meters	20 53	.....
Main Pumping Station	119 01	.....
Reservoir	16 00	.....
Intake extension	1,867 00	3 00
New Conduit	13,274 74	2,006 00
New Engines	20,977 35	2,983 00
High Level Station	37,076 88	.....
36-inch pumping main	6,996 50	.....
	$192,401 17	$5 01 30
	5,001 30	
	*$197,402 47	

DETAILS OF CONSTRUCTION ACCOUNTS.

PIPE LAYING:

Labor, as per pay sheets	$14,699 50
F. W. Unitt, general stores	33 50
John Perkins, hydrants and valves	9,919 34
Samuel, Benjamin & Co., pig lead	1,815 00
Burns & McCormack, pipe laying, etc.,	2,561 95
Wm. Stollery, building valve chambers	3,160 96
St. Lawrence Foundry Co., cast iron pipe, etc	41,075 34
Chapman Valve Co., 4 way hydrants	805 56
Treloar, Blashford & Co., special castings	1,299 48
Galloway, Taylor & Co., special castings	1,962 76
Wm. McGill & Co., coal	86 59
Wilson & Cousins, brass castings	22 47
Bryce Bros., lumber	60
Toronto Rubber Co., rubber boots	13 70
Rose & King, extras on 1886 contract	150 00
John Nicholson, oak valve chamber tops	654 00
Thomas Dean, bronze castings	9 10
Reid & Co., lumber	61 39
McRae & Co., Portland cement	6 25
Board of Works, repairing roadways	14 88
W. K. Colville, cartage	14 75
Thos. J. Clark, hire of scow	40 00
Wm. Hamilton, petty disbursements	1 85
John Abell, steel pipe	526 58
Carried forward	$78,935 55

(*Inclusive of $38,454.19, outstanding accounts brought forward from 1890.)

Brought forward	$78,935 55	
John Mitchell, livery hire	15 00	
Firstbrook Bros., sawdust	14 20	
General stores	171 79	
		$79,136 54

Unpaid accounts, $9.30.

HOUSE SERVICES:

Labor, as per pay sheets	$10,868 73	
F. W. Unitt, general stores	148 08	
Ontario Lead and Barb Wire Co., lead pipe	10,317 30	
St. Lawrence Foundry Co., iron s. c. boxes	2,255 20	
James Evoy, wooden s. c. boxes	246 32	
Wilson & Cousins, brass work	2,287 20	
Warren Scharf Asphalt Co., repairing roadway	16 89	
Morton & Bull, repairing castings	69 40	
Board of Works, repairing roadway	27 99	
Thomas Dean, bronze castings	47 60	
Galloway, Taylor & Co., special castings	197 83	
John Abell, iron s. c. boxes	2,195 00	
Globe Printing Co., advertising	3 75	
Toronto World, advertising	4 50	
Samuel, Benjamin & Co., pig lead	301 00	
W. B. Malcolm, hydrants	10 80	
Reid & Co., lumber	16 31	
General stores	647 97	
	$29,661 87	
Refunds to sundry parties amounts deposited for house services	3,254 75	
		32,916 62

METERS:

Collector H. M. Customs, duty on meters	$12 00	
John Bickerstaffe, freight and warehouse fees	1 01	
Bryce Bros., lumber	7 52	
		20 53

MAIN PUMPING STATION:

Labor, as per pay sheet	$1 45	
Toronto Dry Dock Co., hire of pump	102 00	
Jno. Doty Engine Co., engine repairs	5 60	
Bryce Bros., lumber	9 96	
		119 01

ROSE HILL RESERVOIR:

H. L. Hime, valuators fees	16 00
Carried forward	$112,208 70

Brought forward		$112,208 70
INTAKE EXTENSION:		
Labor, as per pay sheets	$1,088 53	
Rice Lewis & Son, hardware	259 47	
W. B. Hamill, hire of tug	3 50	
St. Lawrence Foundry Co., castings	4 62	
Fox & Co., gaskets for pipe	10 05	
Island Park Ferry Co., towing charges	137 00	
John Abell, castings	105 58	
Robt. F. Nash, stone	91 00	
Bryce Bros., lumber	78 64	
W. K. Colville, cartage	1 50	
C. H. Edwards, ladder	6 20	
J. Leckie, canvas bag, etc	5 75	
Thos. J. Clark, hire of scow	37 50	
Geo. McKay, hire of scow	15 00	
Toronto Ferry Co., tickets	5 00	
Reid & Co., lumber	11 00	
General stores	6 71	
		1,867 00
Outstanding accounts, December 31st, 1891, $3.00.		
NEW CONDUIT:		
Labor, as per pay sheets	$3,815 88	
F. W. Unitt, general stores	12 85	
John Abell, steel pipe and castings	5,338 57	
James Morrison, springs	2 00	
Rice Lewis & Son, hardware	33 61	
Aikenhead and Crombie, washers	96	
T. G. Rice, wire screen	55 00	
Island Park Ferry Co., towing charges	80 50	
St. Lawrence Foundry Co., castings	33 50	
Gall, Anderson & Co. lumber	2 52	
Toronto Rubber Co., rubber mits, etc	10 02	
McRae & Co., cement	44 85	
Rolph, Smith & Co. lithographing	25 00	
Fire and Water, stereotype plates	6 00	
D. Plews, hire of pump	7 50	
Wm. McGill & Co., coal	23 91	
F. B. McNamee, laying conduit	2,484 50	
W. C. Brough, petty disbursements	1 20	
W. K. Colville, cartage	6 50	
Bryce Bros., lumber	8 59	
H. F. Hodson, hire of scow	41 30	
Thos. Dean, castings	3 31	
Carried forward	$12,038 07	$116,075 70

Brought forward	$12,038 07	$116,075 70
Reid & Co., lumber	60 16	
Wm. Ward, filling in old basin	839 98	
Dr. Elias Clouse, medical attendance	22 00	
Thos. J. Clark, hire of scow	184 00	
Wm. Hamilton, petty disbursements	2 00	
Empire Printing and Publishing Co., advertising	3 00	
World Printing Co., advertising	3 00	
News Printing Co., advertising	2 00	
J. Ross Robertson, advertising	2 00	
Jas. Conacher boat hire	3 00	
General stores	115 53	
		13,274 74

Outstanding accounts, December 31st, 1891, $2,006.00.

NEW ENGINES:

Labor, as per pay sheets	$697 92 ✓	
Empire Printing and Publishing Co., advertising	12 00	
Globe Printing Co., advertising	12 75	
C. H. Mortimer, advertising	8 00	
Mail Printing Co., advertising	12 00	
St. Lawrence Foundry Co., castings	211 20 ✓	
Barnabas Gibson, engine house foundations	12,589 00 ✓	
Polson Iron Works Co., new steel well	1,853 64 ✓	
Reid & Co., lumber	33 34	
J. Ross Robertson, advertising	5 00	
News Printing Co., advertising	4 50	
World Printing Co., advertising	6 00	
Newman Bros., new engine house	4,666 00 ✓	
Matt. Warnock, large valve	866 00 ✓	
		20,977 35

Accounts outstanding, December 31st, 1891, $2,983.00.

HIGH LEVEL STATION:

Labor, as per pay sheets	$1,268 63	
Canadian Bridge Co., erecting stand pipe	2,465 00	
Bryce Bros., lumber	15 45	
St. Lawrence Foundry Co., 20 inch bend	418 78	
James Morrison, guard rails, etc	119 12	
John Abell, check valves	293 60	
Wm. Stollery, building engine house, etc.	2,017 40	
J. A. Fowler, architect's fees	120 75	
Geo. F. Blake Manufacturing Co., pumping engines	30,000 00	
Robert Locke, plumbing	65 00	
Thos. Dean, castings	2 40	
Reid & Co., lumber	58 37	
Carried forward	$36,844 59	$150,327 79

Brought forward	$36,844 50	$150,327 79
McRae & Co., cement	37 25	
W. K. Colville, cartage	6 75	
John Whitfield, blacksmithing	12 00	
M. Warnock, 20-inch valve	165 09	
General stores	11 38	
		37,076 88
36-Inch Pumping Main:		
Labor, as per pay sheets	$990 84	
F. W Unitt, general stores	30 10	
Gall, Anderson & Co., lumber	1 68	
St. Lawrence Foundry Co., castings	2,486 67	
Alex. Gartshore, 36-inch pipe	407 59	
Wm. Stollery, masonry	108 56	
Grand Trunk Railway Co., watchman	104 80	
Bryce Bros., lumber	67 57	
Rice Lewis & Son, hardware	75 60	
Matt. Warnock, valves	2,638 25	
Jas. Malloy, sodding	66 00	
Burns & McCormack, gravel	16 59	
W. K. Colville, cartage	2 25	
		6,996 50
		$192,401 17

SCHEDULE No. 3.

RECORD OF PUMPING AT HIGH LEVEL STATION DURING 1891.

Month.	Coal* consumed.	Imp. Gallons pumped per month.	Gallons pumped per lb. of coal.	Av. pressure per sq. inch on force main.	Hours pumping per month.	Av. hours pumping per day.
	lbs.			lbs.	h. m.	h. m.
January	85,500	58,681,081	686.32	64.22	457 35	14 45
February	74,100	52,460,302	707.96	63.00	408 35	15 35
March	85,500	58,924,824	689.17	64.61	459 15	14 49
April	82,100	60,622,489	738.39	64.43	457 00	15 13
May	87,600	71,813,606	819.79	58.71	460 50	14 51
June	83,800	68,977,670	823.12	58.40	445 30	14 51
July	84,900	73,902,469	870.46	56.12	462 20	14 54
August	91,300	75,602,165	828.06	53.71	458 35	14 47
September	104,100	79,856,117	767.10	56.33	442 10	14 44
October	121,300	80,373,143	662.59	66.54	456 10	14 43
November	97,200	71,058,007	731.04	65.90	447 45	14 55
December	108,218	72,628,306	671.12	67.48	457 20	14 45
Totals	1,105,618	824,900,179	.....	61.62	5,413 5	.....
Averages	.....	.....	746.09	....	.....	14 51

*The coal consumed includes that used for banking fires and heating building: no deductions made.

SCHEDULE No. 2.

PERFORMANCE OF No. 1, No. 2 AND No. 3 ENGINES DURING 1891.

Month.	Number of Days Working in each Month.			Number of Hours Pumping in each Month.			Average Number of Hours Pumping each Day.			Number of Strokes per Month.			Average Pressure on Pumps while Working.			Average Level of Water in Well below Zero while Working.			Quantity of Water Pumped per Month in Imperial Gallons.			Total Quantity of Water Pumped per Month.	Total Quantity of Coal Consumed per Month.		Average Coal per Day for each Month.	
	No. 1	No. 2	No. 3	No. 1.	No. 2.	No. 3.	No. 1.	No. 2.	No. 3.	No. 1.	No. 2.	No. 3.	No. 1	No. 2	No. 3	No. 1.	No. 2.	No. 3.	No. 1.	No. 2.	No. 3.	Gallons.	Tons.	Lbs.	Tons.	Lbs.
				h. m.	h. m.	h. m.	h. m.	h. m.	h. m.							ft. in.	ft. in.	ft. in.								
January ..	7	31	31	37 50	731 50	717 30	5 24	23 37	23 9	31,780	466,619	502,988	92	93	93	11 2	11 8	11 8	7,245,840	214,178,121	243,940,968	465,364,929	1,029	980	33	419
February .	12	28	27	58 15	660 0	625 45	4 51	23 34	23 2	49,930	416,616	447,161	93	94	94	11 3	11 7	11 7	11,384,040	191,226,744	217,320,246	419,931,030	941	1,840	33	1,280
March	10	31	27	88 40	736 5	661 55	8 52	23 46	24 31	74,921	491,787	495,512	93	95	96	11 7	11 6	11 7	17,081,988	225,710,233	240,818,832	483,611,053	1,037	295	33	912
April	9	30	28	84 35	705 0	650 25	9 24	23 30	23 13	71,707	475,294	486,894	95	96	96	10 0	10 6	10 8	16,349,196	218,159,946	236,630,484	471,139,626	1,041	1,995	34	1,466
May.....	16	31	28	320 5	734 20	623 15	20 4	23 41	22 15	279,578	504,067	463,541	94	94	95	2 9	6 2	7 0	63,743,784	231,366,753	225,280,926	520,391,463	1,177	995	37	1,968
June ...	29	28	29	628 40	649 35	673 0	21 41	23 12	23 12	526,520	436,460	490,799	94	94	94	1 10	1 11	1 10	120,046,560	200,335,140	238,528,314	558,910,014	1,313	1,225	43	1,574
July.....	31	31	31	564 5	701 10	730 35	18 11	22 37	23 34	462,662	485,402	536,587	94	94	94	2 8	2 8	2 8	105,486,936	222,799,518	260,781,282	589,067,736	1,345	705	43	797
August ..	31	31	31	667 30	724 5	736 35	21 32	23 21	23 45	546,304	484,363	531,830	94	94	94	4 2	4 2	4 2	124,557,312	222,322,617	258,469,380	605,349,309	1,379	1,890	44	1,229
September.	28	30	30	628 25	712 55	712 45	22 27	23 46	23 45	526,077	493,997	519,938	93	92	92	4 9	4 7	4 7	119,945,556	226,744,623	252,689,868	599,380,047	1,308	1,525	43	1,251
October ..	31	31	31	741 45	731 30	728 30	23 55	23 36	23 30	658,082	507,113	539,751	92	92	92	5 5	5 5	5 5	150,042,696	232,764,867	262,318,986	645,126,549	1,421	1,305	45	1,719
November.	29	30	30	624 0	704 0	694 30	21 30	23 30	23 9	526,531	478,564	499,925	94	94	94	6 0	6 0	6 0	120,049,068	219,660,876	242,963,550	582,673,494	1,303	1,785	43	926
December .	31	31	27	692 30	737 20	626 50	22 20	23 47	26 13	552,134	516,031	474,455	92	92	93	5 6	5 6	5 6	125,886,552	236,858,229	230,685,130	593,429,911	1,348	1,700	43	1,022
Totals	264	363	350	5,136 20	8,528 50	8,181 35	....	....	....	4,267,226	5,756,313	5,989,381	...	...	...	....	....	....	981,819,528	2,642,127,667	2,910,427,966	*6,534,375,161	14,650	240	.....	
Averages..	...	..	...	....	...	....	....	....	....	.....	.....	.....	...	...	...	6 6	6 10	6 10	.....	.....	.....	.....	.....	.....	.....	

*Allowing 5% for slip, total water pumped equals 6,207,656,403 gallons.

SCHEDULE No. 4.

RECORD OF GAUGING AT ROSE HILL RESERVOIR FOR EACH MONTH OF 1891.

Month.	Elevation of lowest water above zero.		Elevation of highest water above zero.		Average elevation above zero.		Average depth in Reservoir.		Average contents in Imperial gallons.
	ft.	in.	ft.	in.	ft.	in.	ft.	in.	
January	203	3	210	5	207	3	11	3	12,054,812
February	269	5	213	5	211	4	15	4	21,588,013
March	211	8	216	0	214	7	18	7	29,389,835
April	211	5	216	8	213	5	17	5	26,457,972
May	207	5	215	7	211	0	15	0	20,591,090
June	206	1	217	1	213	6	17	6	26,665,331
July	214	4	217	9	216	3	20	3	34,230,200
August	213	5	217	4	215	1	19	1	30,699,427
September	207	8	216	6	211	11	15	11	22,782,630
October	207	3	213	6	210	3	14	3	18,834,088
November	213	4	217	6	215	11½	19	11½	33,347,501
December	210	3	216	9	214	0⅓	18	0⅓	27,979,973
Averages	.....		.....		212	10½	16	10½	25,368,406

SCHEDULE No. 5.

COMPARATIVE STATEMENT, SHOWING NUMBER OF GALLONS PUMPED, QUANTITY AND COST OF FUEL, ETC., FROM 1876 TO 1891.

Year.	Gallons of Water Pumped.	Quantity of Fuel.	Total Cost of Fuel.	Average Daily Quantity of Water Pumped.	Average Daily Consumption of Coal.	Gallons of Water Pumped for 1 lb. of fuel.
		Lbs.	$ c.	Gallons.	Lbs.	
1876	1,625,139,876	6,998,282	19,645 75	4,451,202	19,093	$232\frac{55}{100}$
1877	2,633,433,932	10,407,992	25,556 29	7,214,887	28,515	$253\frac{2}{100}$
1878	1,417,370,918	8,120,000	15,196 20	3,883,208	22,246	$174\frac{55}{100}$
1879	1,610,104,542	10,872,211	19,313 07	4,411,245	29,787	$148\frac{9}{100}$
1880	1,785,859,706	11,694,808	28,455 72	4,879,422	31,953	$152\frac{17}{100}$
1881	1,910,430,419	12,391,874	31,410 04	5,234,056	33,950	$154\frac{18}{100}$
1882	2,108,933,115	11,685,556	30,170 64	5,777,899	32,015	$180\frac{47}{100}$
1883	2,809,956,484	17,266,679	43,529 08	7,698,511	47,306	$162\frac{74}{100}$
1884	3,645,442,082	19,920,782	52,525 56	9,960,224	54,428	183
1885	3,537,482,598	18,644,465	46,589 27	9,691,733	51,081	$189\frac{73}{100}$
1886	4,134,376,998	19,285,371	41,979 32	11,327,060	52,837	$214\frac{37}{100}$
1887	4,417,938,169	23,283,900	50,051 85	12,103,940	63,791	$189\frac{74}{100}$
1888	4,041,964,514	20,457,935	46,600 77	11,073,875	56,049	$197\frac{57}{100}$
1889	4,148,781,634	19,231,940	44,135 10	11,366,525	52,690	$215\frac{72}{100}$
1890	5,249,760,226	24,615,830	56,239 99	14,382,904	67,536	$212\frac{96}{100}$
1891	6,207,656,403	29,300,240	60,012 77	17,007,275	80,291	$211\frac{86}{100}$

SCHEDULE No. 6.

QUANTITY OF WATER PUMPED AND AMOUNT CONSUMED DURING EACH MONTH OF 1891, WITH AMOUNT OF DAILY CONSUMPTION.

Month.	Total Quantity Pumped per Month.	Quantity Stored in Reservoir at end of each Month.	Quantity Consumed during each Month.	Average Daily Consumption.	*Total Quantity of Coal Consumed per Month.	Average Daily Consumption of Coal.
	Gallons.	Gallons.	Gallons.	Gallons.	Lbs.	Lbs.
Stored at 31st December, 1890	.....	3,863,627	.....	.....	.....	.....
January	465,364,929	18,248,420	450,980,136	14,547,746	2,058,980	66,419
February	419,931,030	23,591,690	414,587,760	14,806,706	1,883,840	67,280
March	483,611,053	31,203,822	475,998,921	15,354,804	2,074,295	66,912
April	471,139,626	21,587,244	480,756,204	16,025,207	2,083,995	69,466
May	520,391,463	21,786,475	520,192,232	16,780,395	2,354,995	75,968
June	558,910,014	32,212,612	548,483,877	18,282,796	2,627,225	87,574
July	589,067,736	34,986,800	586,293,548	18,912,759	2,690,705	86,797
August	605,349,309	29,812,793	610,523,316	19,694,300	2,759,890	89,029
September	599,380,047	13,155,358	616,037,502	20,534,583	2,617,525	87,251
October	645,126,549	25,421,180	632,860,707	20,414,861	2,843,305	91,719
November	582,673,494	32,464,809	575,629,865	19,187,662	2,607,785	86,926
December	593,429,911	28,966,876	596,927,844	19,255,737	2,697,700	87,022
Totals	6,534,375,161	.....	6,509,271,912	.....	29,300,240	.....
Averages	.....	.....	.....	17,733,130	$1,220\frac{995}{2000}$ tons.	$40\frac{197}{2000}$ tons.

*Does not include Coal Consumed at High Level Station.

SCHEDULE No. 7.

Year.	Average Daily Consumption of Water.	Population.	Average Daily Consumption of Water per capita for all Purposes.	Total Number of House Services in use in each Year.	Number of House Services put in in each Year.	Total Number of hoists in use in each Year.	Total Number of Meters in use in each Year.	Total Number of Miles of Mains in use in each Year.	Average Pressure on Pumps while Working.		
									No. 1 Worthington Engine.	No. 2 Worthington Engine.	No. 3 Inglis & Hunter Engine.
			Gallons.					Miles.			
1875.....	3,424,000	68,678	49.86	2,769	842	....	....	49.810	88.10	.....	.....
1876.....	4,451,202	71,693	62.09	3,512	740	....	....	80.250	88.78	97.51	.....
1877.....	2,812,000	67,386	41.74	4,518	1,006	....	....	107.570	83.33	97.69	.....
1878.....	3,883,208	70,867	54.79	6,707	2,189	28	....	110.240	89.65	96.64	.....
1879.....	4,411,245	73,813	59.76	8,568	1,861	47	....	111.290	95 28	99.04	.....
1880.....	4,879,422	75,110	64.96	9,582	1,014	66	....	113.312	98.22	99.52	.....
1881	5,234,056	76,934	68.03	12,236	2,654	79	...	115 518	96.32	100.78	.....
1882	5,777,899	81,372	71.01	14,062	1,826	94	....	116.145	94.85	101.66	.....
1883.....	7,698,511	91,796	83.87	16,276	1,766 448	109	....	131.352	94.27	106.49	.....
1884	9,960,224	105,211	94.66	18,363	2,087	130	....	138.301	99.146	107.036	.....
1885.....	9,706,127	111,800	86.82	20,767	2,344	140	195	143.257	98.84	106.45	103.88
1886.. ...	11,344,337	118,403	95.81	23,643	2,936	152	256	156.042	104.88	104.92	104.67
1887... ..	12,060,610	126,169	95.59	26,893	3,315	176	332	165.894	.....	.....	.....
1888.....	11,069.784	166,809	66.36	29,883	3,055	174	897	182.625	93.41	92.36	94.57
1889.....	11,378,962	175,000	65.02	34,056	3,288	222	1,347	212.832	94.25	94.82	94.92
1890.....	14,434,722	185,000	78.02	36,192	2,191	229	1,479	229.257	92.83	93.55	93.58
1891.....	17,007,275	188,904	90.03	38,250	2,111	230	1,544	237,967	93.33	93.66	93.91

SCHEDULE No. 8.

COMPARATIVE STATEMENT OF COAL CONSUMED AND WATER PUMPED.

Months.	1890. Coal Consumed.		1890. Water Pumped.	1891. Coal Consumed.		1891. Water Pumped.
	Tons.	Lbs.	Gallons.	Tons.	Lbs.	Gallons.
January	817	1,685	368,860,870	1,029	980	465,364,929
February	745	505	330,203,407	941	1,840	419,931,030
March	883	1,625	386,562,180	1,037	295	483,611,053
April	895	1,380	397,111,203	1,041	1,995	471,139,626
May	934	515	405,528,900	1,177	995	520,391,463
June	1,029	1,070	428,506,678	1,313	1,225	558,910,014
July	1,122	695	489,092,985	1,345	705	589,067,736
August	1,197	175	484,077,356	1,379	1,890	605,349,309
September	1,186	1,740	495,605,355	1,308	1,525	599,380,047
October	1,240	1,880	522,125,700	1,421	1,305	645,126,549
November	1,176	630	497,537,831	1,303	1,785	582,673,494
December	1,077	1,750	443,547,761	1,348	1,700	593,429,911
Totals	12,307	1,830	5,249,760,226	14,650	240	*6,534,375,161

*Less 5 for slip—6,207,656,403.

	Tons.	Lbs.
Coal Consumed in 1890	12,307	1,830
" " 1891	14,650	240
Difference in favor of 1890	2,342	410

	Gallons.
Water Pumped in 1890	5,249,760,226
" " 1891	6,534,375,161
Excess in 1891 over 1890	1,284,614,935

COMPARATIVE STATEMENT OF PUMPING 1,000 GALLONS OF WATER.

Year.	Cost of Maintenance.	Gallons Pumped.	Cost of Maintenance per 1,000 Gals.	Cost of Fuel alone per 1,000 Gals.	Total cost of Pumping 1,000 Gals.
	$ c.		c.	c.	c.
1885	65,082 39	3,537,482,598	1.840	1.317	7.240
1886	65,579 74	4,134,376,998	1.586	1.075	6.561
1887	76,597 16	4,417,938,169	1.734	1.132	6.643
1888	76,059 72	4,041,964,514	1.880	1 126	7.591
1889	75,360 77	4,148,781,636	1.816	1.063	8.259
1890	83,136 12	5,249,760,226	1.583	1.0 8	7.764
1891	89,030 35	6,534,375,161	1.362	0 991	6.261

SCHEDULE No. 9,

COMPARATIVE STATEMENT OF WATER PUMPED PER POUND OF COAL.

Months.	1888.	1889.	1890.	1891.
	Gallons.	Gallons.	Gallons.	Gallons.
January	184	213	225	226
February	178	204	221	212
March	187	208	218	233
April	187	218	221	225
May	190	209	217	221
June	191	214	208	212
July	192	212	217	219
August	208	208	202	219
September	214	231	213	229
October	146	220	210	226
November	214	218	211	223
December	213	231	205	219
	192	215	214	222

SCHEDULE No. 10.

TOTAL LIST OF MAINS LAID DURING 1891.

(For Mains laid previous to 1891 see Report of 1890.)

Street, etc.	Side of Street.	Location.	No. of Feet.
TWELVE-INCH MAINS :			
Eastern av	North	From Olive eastward across Don connected with old main	840
Queen west	"	" St. Patrick's Market to 70 feet west of Bathurst (and connections at University)	3,864
Yonge	West	" Isabella to Bloor (6-inch taken out	995
		Total twelve-inch	5,699
SIX-INCH MAINS :			
Admiral rd	East	From Bernard avenue south to old main	660
Bain av	North	" Carlaw west (including con. on Carlaw)	427
Bernard av	"	" Bedford road to Admiral road	366
Brock av	West	" End of old main northward	421
Biological col	East	" College street northward.	250
Burnfield av	North	" Shaw street westward	18
Beatrice av	West	" Arthur street northward	1,147
Camden	North	" Maud street, east to old main	222
Caroline av	West	" Eastern avenue to Queen street	1,024
Castle av	North	" Jogs in Walmer road	126
Cawthra av	South	" Jarvis to west end of street	316
Chapel	East	" St. Joseph to Irwin avenue	396
Clement av	South	" Roncesvalles avenue, eastward	296
Clifford	North	" End of old main, eastward	96
Cowan av	West	" Springhurst to King street	1,541
Cypress	East	" Eastern avenue, south	312
Czar	South	" Yonge street to St. Nicholas	225
Delaware av	West	" 60 ft. n. of second hydrant northward.	108
Devonshire pl	East	" Bloor street to Hoskin avenue	1,293
Dominion av	N. & E.	" Dunn avenue eastward	839
Dunn av	East	" Starr avenue to Dominion avenue	164½
Earnbridge	South	" End of old main to Strickland place	150
Emerson av	West	" Bloor street, 300 feet north	322½
Exhibition av	"	" King street, southward	350
Garden av	North	" Roncesvalles avenue, east to old main.	746
Grace	West	" Arthur to College street	1,656
Hoskin av	South	" St. George street, eastward	882
Huron	East	" Phoebe street to 64 ft. north of Grange	764
"	"	" St. Patrick to College street	1,785
Kensington cres	South	" Park road to Huntley street	445
London	North	" Manning to Euclid avenue	295
Macpherson av	"	" Rathnally avenue, eastward	299
Manning av	East	" Dupont street north to near C.P.R.R.	200
Markham exten	West	" Olive avenue, northward	300

MAINS LAID DURING 1891—*Continued.*

Street.	Side of Street.	Location.	No. of Feet.
SIX-INCH MAINS—*Continued.*			
Marlboro' pl	South	From End of m'n to 12-in. m'n inside C.P.R.R	326
Mackenzie av	West	" Wallace avenue south to old main	176
Noble	North	" End of old main to C.P.R. fence	393
North drive	"	" Old hydrant west to Rosedale road	192
O'Hara av	West	" 5th hydrant north of Queen to G.T.R.	224
Phoebe	North	" Soho to Huron street	268
Prince Arthur av.	South	" Bedford road, east to old main	290
Queens park		" Queens Park crescent along north and west side of Parliament buildings to Biological college main	1,443
"		" Queens Park crescent, west, under Parliament buildings to west side	1,926
Queen east		" Lee avenue to city limits	1,734
Roncesvalles av	East	" South of Lucas to Clement avenue	375
Roxborough	North	" Yonge, 675 feet westward	676
Smith	"	" 48 ft. w. of hydrant to 36 ft. e. of same	84
Sheridan av	West	" Dundas to first hydrant south	290
Shanly av	North	" Dovercourt to 15 ft. east of west line of Delaware	329
"	"	" Dufferin street to Hamburgh avenue	300
Shaw	West	" Burnfield avenue, northward	276
Spadina rd	"	" Dupont street, southward	430
"	"	" 24 ft. south of second hydrant south of Bernard avenue northward	322
Springhurst av	North	" Spencer to Tyndall avenue	328
"	"	" Cowan to Dunn avenue	353
"	"	" Dunn to Close avenue	443
"	"	" Sec'd hydrant w. of Jameson 180ft. w.	180
Steiner		" First hydrant, 96 feet northward	96
Strickland pl	West	" Noble to Earnbridge	285
St. Nicholas	East	" St. Alban to St. Joseph	428
St. George	West	" Bloor street to Prince Arthur avenue.	523
"	East	" South line of Lowther, 148ft. southward	140
"	West	" 12ft. s. of south line of Dupont to 120ft. s.	120
Sully	"	" College street south to old main	443
Sully cres	North	" Sully street west to old main	110
Sylvan av	"	" Dufferin street east to second hydrant	471
Symington av	West	" Bloor street south	300
"	"	" Royce avenue south	192
Soho	"	" Queen to Phoebe street	465
Tranby av	North	" Bedford road, eastward	179
Tyndall av	West	" Springhurst avenue s. to track G.T.R.	235
University		" Hoskin avenue to n. side of University	339
"		Along north side of University	426
"		" west " " (new)	254
"		" east " "	350
"		" south " "	437
"		From south-east cor. of University to library	388
Victoria	West	" King to Adelaide street	457

MAINS LAID DURING 1891—*Continued.*

Street.	Side of Street.	Location.	No. of Feet.
SIX-INCH MAINS—*Continued.*			
Walmer rd.....	West ..	From Castle avenue, south to old main	66
"	" ..	" Castle avenue, northward	495
Wallace av.....	North ..	" McKenzie avenue, westward to hydrant	184
"	" ..	" 1,272 ft. to 1,576 ft. west from Dufferin	304
Wilson av	" ..	" Broadview avenue, eastward to hydrant	196
Withrow av	" ..	" Broadview av. to 210 ft. e. of first hydrant	451
		Total six-inch	385,993
FOUR-INCH MAINS:			
Foster pl.....	North ..	From Elizabeth into Incandescent Light Co.	272
Orde	" ..	" Old hydrant east to University street.	232
"	South ..	" Old hydrant west to McCaul street ..	143
Gilead pl	West ..	" Eastern avenue n. to hydrant at end	120
Pears	South ..	" 168 ft. west of second hydrant east of Avenue road, east	560
Regent av	S. & N.	" 66 ft. w. of Regent street to 163 ft. east	293
Victoria pl.....	East ..	" Gerrard to end of street	225
		Total four-inch	1,915

MAINS ABANDONED DURING 1891.

Street, etc.	Location.	No. of Feet.
TWELVE-INCH CEMENT:		
Huron.....	East side, from College street to St. Patrick	1,786
"	" " Phoebe to 64 feet north of Grange ...	764
Phoebe	North side, from Huron to Soho	230
Soho	West side, from Queen to Phoebe	400
SIX-INCH IRON:		3,180
Yonge	West side, from Isabella to Bloor street	1,052

SUMMARY OF MAINS.

Mains throughout the City, of all sizes and descriptions, including those on streets, Government, private and other property at end of 1891.

Size.	Length in feet.
36-inch Mains	1,866
30 " "	10,023
24 " "	24,397
20 " "	3,953
12 " Sub-Mains	197,915
10 " "	13,320
8 " "	7,922
6 " "	906,470½
4 " "	36,124½
3 " "	9,987¼
2 " "	831½
1 " "	3,162
Old iron and cement mains, 12, 10, 8 and 6-inch	40,460
Total length in feet	1,256,433¾

Total in miles, 237.96.

SCHEDULE No. 11.

HYDRANTS PLACED IN POSITION DURING 1891.

(For all former hydrants placed, see Report Book 1890.)

Street, etc.	Side of Street.	Location.
Admiral rd	East	292 feet south of Bernard avenue.
Bain av	North	325 " west of Carlaw avenue.
Beatrice av	West	280 " north of Arthur street.
"	"	599 " " "
"	"	890 " " "
Bernard av	North	24 " east of Admiral road.
Brock av	West	648 " north of Bloor.
Caroline av	"	314 " north of Eastern avenue.
"	"	649 " " "
Cawthra av	South	End of street, 306 feet west from Jarvis.
Clement av	"	276 feet east of Roncesvalles avenue.
Cowan av	West	287 " north of Springhurst avenue.
"	"	600 " " "
"	"	597 " south of King street.
"	"	291 " " "
Cypress	East	241 " south of Eastern avenue.
Czar	South	20 " west of Yonge street.
Dominion av	North	240 " east of Dunn avenue.
"	East	About centre of southern jog in street.
"	North	40 feet east of Spencer avenue.
Dunn av	East	110 " north of Dominion avenue.
Eastern av	North	180 " west of Cypress street.
"	"	Opposite crematory.
"	"	North-east corner of first street east of Don.
Emerson av	West	256 feet north of Bloor street.
Exhibition av	"	283 " south of King street.
Garden av	North	289 " east of Roncesvalles avenue.
"	"	597 " " "
Gilead pl	West	At north end of place.
Hoskin av	South	444½ feet east of Devonshire place.
Grace	West	300 " north of Arthur street.
"	"	576 " " "
"	"	Opposite south line of Mansfield avenue.
"	"	" " Henderson avenue.
"	"	100 feet south of College street.
Huron	East	209 " north of Sullivan street.
"	"	133 " " Grange avenue.
"	"	169 " " St. Patrick's street.
"	"	102 " " D'Arcy street.
"	"	218 " " Baldwin street.
"	"	273 " " Cecil.
Kensington cres	South	162 " east of Park road.
Macpherson av	North	246 " " Rathnally avenue.
Manning av	East	182 " north of Dupont street.
Markham exten	West	282 " " Olive avenue.

HYDRANTS PLACED IN POSITION DURING 1891—*Continued.*

Street, etc.	Side of Street.	Location.
Marlboro' pl	North ..	647 feet east of Avenue road.
Noble	" ..	East end of street, near C.P.R. fence.
O'Hara av	West ..	North " " "
Pears	South ..	End of main, 1,073 feet east of Avenue road.
Prince Arthur av.	" ..	133 feet east of Bedford road.
Queen east.....	North ..	256 " " Lee avenue.
"	" ..	601½ " " "
"	" ..	923½ " " "
"	" ..	1222 " " "
"	" ..	1495½ " " "
"	" ..	1785 " " "
Queen west.....	" ..	160 " " Bathurst street.
"	" ..	80½ " " Hackney street.
"	" ..	42½ " west of Denison avenue.
"	" ..	111 " east of "
"	" ..	184 " " Esther street.
"	" ..	136½ " " Vanauley street.
"	" ..	71 " " Cameron street.
"	" ..	112 " " Soho.
"	" ..	16 " west of John street.
Queens park.....	....	North of Parliament buildings (in quadrangle), 4 way.
"	...	North-west corner Parliament buildings, 4 way.
"	....	South-west " " " "
"	....	Opposite Biological College, 4 way.
Regent av	North ..	163 feet east of Regent street.
Richmond	South ..	Opposite Canada Life, 4 way.
Roncesvalles av..	East ..	35 feet south of Clement avenue.
Roxborough av..	North ..	184 " west of Yonge street.
"	" ..	566 " " "
Shaw	West ..	255 " north of Burnfield avenue.
Sheridan av ...	" ..	236 " south of Dundas street.
Smith	South ..	530 " east of Pape avenue.
Spadina av	West ..	50 " north of Queen street.
Spadina rd.....	" ..	14 " south of Dupont street.
"	" ..	389 " " "
"	" ..	38 " south of Bernard avenue.
Springhurst av ..	North ..	51 " west of Cowan avenue.
"	" ..	182 " west of Dunn avenue.
St. George	West ..	22½ " south of Dupont street.
"	" ..	158 " north of Bloor street.
St. Nicholas	East ..	202 " north of St. Alban street.
Strickland pl....	West ..	135 " south of Earnbridge.
Sylvan av	North ..	201 " east of Dufferin street.
Symington av....	West ..	277 " south of Bloor street
Tyndall av	" ..	191 " south of Springhurst avenue.
University	...	At south-east corner.
"	....	At north-east corner.
"	....	In centre of quadrangle.
"	....	Near north-west corner.
"	....	At south-west corner.

HYDRANTS PLACED IN POSITION DURING 1891—*Continued.*

Street, etc.	Side of Street.	Location.
University	....	At west side of library, 4 way.
Victoria pl	East	At end of street 203 feet south of Gerrard.
Victoria	West	One half King and Adelaide.
"	"	Opposite Canada Life, 4 way.
"	"	Opposite Confederation Life, 4 way.
Wallace av	North	165 feet west of McKenzie avenue.
"	"	1576 " " Dufferin street.
Wilson av	"	142 " east of Broadview avenue.
Walmer rd	West	77 " north of Castle avenue.
"	"	403 " " "
Withrow av	North	287 " east of Broadview avenue.
Yonge	West	170 " south of Bloor street.
"	"	140 " north of Czar street.
"	"	85 " south of St. Mary street.

SUMMARY OF HYDRANTS.

Number of hydrants set on streets at the end of 1890	2,550
" " " private and other property at end of 1890	49
	2,599
Number of hydrants (additional) set on streets during 1891	99
" " " " private and other property 1891	10
Total	2,708

During the year 1891, there have been set eight four-way Chapman hydrants, included in this number.

SCHEDULE No. 12.

SHOWING THE SIZE AND POSITION, ETC. OF VALVES PLACED DURING 1891.

Street, etc.	Side of Street.	Location.
TWELVE-INCH CHECK VALVES :		
Avenue rd	East	600 feet north of Cottingham street.
"	West	On force main at standpipe.
"	"	On connection between force and discharge at standpipe.
"	Centre	South line of Cottingham street.
Yonge	West	" " "
SIX-INCH CHECK VALVES :		
Avenue rd	West	North of U.C.C. meter.
Biological Col	N.-East.	" line of College street.
Breadalbane	South	West " Yonge street.
St. Alban	"	" " "
St. Joseph	"	" " "
University cres	West	North " College.
THIRTY-SIX-INCH STOP VALVES :		
Esplanade	North	North of connections with 24-inch and 30-inch and south of new 30-inch mains.
THIRTY-INCH STOP VALVES :		
Esplanade	North	West of 36-inch main on new 30-inch connection.
TWENTY-INCH STOP VALVES :		
High Level Pump'g Stat'n		Near coal house door north-east corner of boiler house.
TWELVE-INCH STOP VALVES :		
Avenue rd	West	On force main at standpipe.
"	"	On connection between force and discharge mains at standpoint.
Eastern av	North	East line of Cypress.
"	"	" " first street east of Don.
Queen west	"	" " John street.
"	"	West " "
"	"	East " Soho street.
"	"	West " Peter street.
"	"	East " Spadina avenue.
"	"	West " "
"	"	East " Esther street.
"	"	West " "
"	"	East " Hackney street.
"	"	" " Bathurst street.
"	"	West " "
Yonge	West	South " Czar street.

STOP VALVES PLACED IN POSITION DURING 1891—*Continued.*

Street, etc.	Side of Street.	Location.
NINE-INCH STOP VALVES:		
John	West ..	South line of Queen street.
SIX-INCH VALVES:		
Admiral rd.....	East ..	South line of Bernard avenue.
Avenue rd	" ..	600 feet North of Cottingham street.
"	West ..	On supply-pipe U. C. C. at meter.
Bain av	North ..	West line of Carlaw avenue.
Beatrice	West ..	North " Arthur street.
Bernard av.....	North ..	West " Bedford road.
Camden	" ..	East " Maud street.
Caroline av.....	West ..	South " Queen street.
"	" ..	North " Eastern avenue.
Cawthra av. . ..	South ..	West " Jarvis street.
Chapel.....	East ..	North " St. Joseph street.
Clement av.....	South ..	East " Roncesvalles avenue.
Cowan av	West ..	South " King street.
"	" ..	17 feet north of north line of Springhurst street.
Cypress av	East ..	South line of Eastern avenue.
Czar.....	South ..	West " Yonge street.
Devonshire pl ...	East ..	South " Bloor street.
"	" ..	North " Hoskin avenue.
"	" ..	South " "
Dominion av	North ..	East " Dunn avenue.
Earnbridge av ...	South ..	" " Brock avenue.
Emerson av	West ..	North " Bloor street.
Garden av	North ..	East " Roncesvalles avenue.
Grace	West ..	South " College street.
"	" ..	North " Arthur street.
Grand av	" ..	" " Springhurst avenue
Huron.....	East ..	" " Phœbe street.
"	" ..	" " Baldwin.
Hoskin av	South ..	East " St. George street.
Irwin av.....	North ..	" " Chapel street.
Kensington cres .	South ..	" " Park road.
"	" ..	West " Huntley street.
London	North ..	East " Manning avenue.
Macpherson av ..	" ..	" " Rathnally avenue.
Marlboro pl	" ..	Water hydrant at C. P. R. fence, 655 feet east of Avenue road.
Markham exten..	West ..	North line of Olive avenue.
Noble	North ..	East " Brock avenue.
Prince Arthur av.	South ..	" " Bedford road.
Queen west	" ..	" " Esther street.
Queens park cres.	West ..	In eastern entrance gate opposite s.line of St. Alban av.
For Parliam't b'gs	" ..	Six feet inside fence opposite eastern porch of Parliament buildings.
Queens park	....	On west side Parliament buildings opposite west porch.
Roncesvalles av..	East ..	North line of Fermanagh avenue.

STOP VALVES PLACED IN POSITION DURING 1891—*Continued.*

Street, etc.	Side of Street.	Location.
SIX-INCH VALVES—*Continued.*		
Roxburgh	North	West line of Yonge street.
Shanley av	"	East " Dufferin street.
"	"	" " Dovercourt road.
"	"	West " Delaware avenue.
Sheridan av	West	South " Dundas street.
Spadina av	"	North " Queen street.
Spadina rd	"	South " Dupont street.
St. George	"	North " Bloor street.
St. Nicholas	East	South " St. Joseph street.
"	"	North " St. Alban street.
Springhurst av	North	West " Dunn avenue.
"	"	East " "
Strickland pl	West	North " Noble street.
Sully cres	North	West " Sulley street.
Sully	West	South " College street.
Sylvan av	North	East " Dufferin street.
Symington av	West	South " Royce avenue.
"	"	" " Bloor street.
St. Vincent	East	" " Breadalbane street.
Tranby av	North	East " Bedford road.
Victoria	West	North " King street.
"	"	South " Adelaide street.
University	North	Near kitchen.
"	South	Opposite east pillar of porch.
Vine	East	South line of Eastern avenue.
Walmer rd	West	" " Castle avenue.
"	"	North " "
Withrow av	North	East " Broadview avenue.
FOUR-INCH VALVES:		
Foster pl	North	East line of Elizabeth street.
Orde	"	32 feet east of west fence of Queen's avenue.
"	South	East line of McCaul street.
Regent av	"	" " Regent street.
Victoria pl	East	South " Gerrard street.
Gilead pl	West	North " Eastern avenue.

VALVES TAKEN OUT DURING THE YEAR 1891.

Street, etc.	Side of Street.	Location.
SIX-INCH STOP VALVE:		
Yonge	West ..	South line of St. Mary street.
TWELVE-INCH CHECK VALVES:		
Marlboro'	North ..	West line of Yonge street.

SUMMARY OF VALVES ON STREETS.

Size.	In use at end of 1890.	Put in during 1891.	Taken out during 1891.	Total at the end of 1891.
STOP-VALVES:				
36 inches.	4	1	. .	5
30 "	7	1	....	8
24 "	16	..	....	16
20 "	1	1	....	2
12 "	310	16	....	326
10 "	9	....	....	9
9 "	13	1	....	14
8 "	12	....	....	12
6 "	1333	71	1	1403
4 "	37	6	....	43
3 "	23	....	....	23
Total	1765	97	1	1861
CHECK-VALVES:				
12 inches.	7	5	1	11
6 "	44	6	....	50
Total	51	11	1	61

SCHEDULE No. 13.

STATEMENT OF HOUSE SERVICES LAID DURING 1891.

Street.	½-in.	⅝-in.	¾-in.	1-in.	2-in.	4-in.	6-in.
Abbs	1	..	..	..	..	..	..
Addison	1	..	..	..	..	..	..
Adelaide, east	..	..	..	1	..	2	..
Adelaide, west	3	..	..	3	..	..	..
Admiral road	8	..	..	..	..	..	..
Agnes	..	1	..	..	..	..	..
Albert	..	..	..	1	..	..	..
Allen avenue	6	..	..	..	..	..	..
Anderson	3	..	..	..	..	..	..
Argyle	1	..	..	..	..	..	..
Atlantic avenue	1	..	..	..	..	..	..
Arthur	5	..	..	..	..	..	..
Aitken avenue	8	..	..	..	..	..	..
Arnold avenue	1	..	..	..	..	..	..
Augusta avenue	1	..	..	..	..	..	..
Austin avenue	9	..	..	..	..	..	..
Avenue road	27	1	1	1	1	..	..
Avenue lane	1	..	..	..	..	..	..
Badgerow avenue	2	..	..	..	..	..	..
Bain avenue	1	..	..	..	..	..	..
Bartlett avenue	7	1	..	..	..	..	..
Barton avenue	5	..	..	..	..	..	..
Bathurst	54	..	..	..	1	..	..
Bay	1	..	..	..	..	1	..
Beaumont road	..	..	..	1	..	..	..
Beaconsfield avenue	3	..	..	..	..	..	..
Beatty avenue	2	..	..	..	..	..	..
Bear	1	..	..	..	..	..	..
Bedford road	12	..	..	..	..	..	..
Belmont	2	..	..	..	..	..	..
Bernard	5	..	1	..	..	..	..
Beverley	8	..	..	..	..	..	..
Birch avenue	2	..	..	..	..	..	..
Binscarth road	..	..	1	..	..	..	..
Birtle avenue	1	..	..	..	..	..	..
Bismarck avenue	12	..	..	..	..	..	..
Blair avenue	9	..	..	..	..	..	..
Blevins avenue	38	..	..	..	..	..	..
Bleeker avenue	4	..	..	..	..	..	..
Bloor, east	..	..	1	..	..	..	..
Bloor, west	3	1	..	..	..	..	..
Bolton avenue	5	..	..	..	..	..	..
Bond	2	..	..	..	..	..	..
Booth avenue	14	..	..	1	..	..	..
Borden	24	..	..	..	..	..	..
Boswell avenue	6	1	..	..	..	..	..

HOUSE SERVICES LAID DURING 1891—*Continued.*

Street.	½-in.	⅝-in.	¾-in.	1-in.	2-in.	4-in.	6-in.
Boustead avenue	1	..	..	..	..	..	..
Breadalbane	2	..	..	..	..	..	..
Brighton avenue	4	..	..	..	..	..	..
Broadview avenue	9	..	..	1	1	..	..
Brock avenue	12	..	..	..	..	..	..
Brookfield	2	..	..	..	..	..	..
Brooklyn avenue	4	..	..	..	..	..	..
Brown	6	..	..	..	..	..	..
Brunswick avenue	9	..	..	..	..	..	..
Buchanan	3	..	..	..	..	..	..
Caer Howell	1	..	..	..	..	..	..
Camden	2	..	..	..	..	..	..
Campbell avenue	3	..	..	..	..	..	..
Carlaw avenue	3	..	..	..	..	..	..
Carlton	1	1	..	..	..	..	..
Caroline	10	..	..	..	..	..	..
Castle Frank road	..	..	2	..	..	..	..
Cecil	1	..	..	..	..	..	..
Centre	2	..	..	..	..	..	..
Centre road	1	..	..	..	..	..	..
Chestnut	1	..	..	..	..	..	..
Christie	4	..	..	..	..	..	..
Church	5	..	1	1	..	..	..
Claremont	7	..	..	..	..	..	..
Classic avenue	2	..	..	..	..	..	..
Clement avenue	2	..	..	..	..	..	..
Clinton	7	..	..	..	..	..	..
Clifford	3	..	..	..	..	..	..
Close avenue	12	..	..	..	..	..	..
College	10	1	2	..	..	1	..
Collier	15	..	..	..	..	..	..
Concord avenue	42	..	..	..	..	..	..
Coolmine road	1	..	..	..	..	..	..
Cottingham	2	..	..	..	..	..	..
Cowan avenue	25	..	..	..	..	..	..
Crawford	16	..	..	..	..	..	..
Cumberland	7	..	..	..	..	..	..
Cunningham	1	..	..	..	..	..	..
Curzon	1	..	..	..	..	..	..
Czar	19	..	..	..	..	..	..
Dalhousie	5	1	..	1	..	..	..
Danforth avenue	1	..	..	..	..	..	..
D'Arcy	2	..	..	..	..	..	..
Davenport road	5	..	..	..	..	..	..
Defoe	1	..	..	..	..	..	..
DeGrassi	9	..	..	..	..	..	..
Delaware avenue	17	..	..	..	..	..	..
Denison avenue	2	..	..	..	..	..	..
Dewson	1	..	..	..	..	..	..
Douro	8	..	..	..	..	..	..

HOUSE SERVICES LAID DURING 1891—*Continued.*

Street	½-in.	⅝-in.	¾-in.	1-in.	2-in.	4-in.	6-in.
Dovercourt road	31	..	..	1	..	..	..
Dowling avenue	14	..	..	..	..	..	..
Duchess	..	..	..	1	..	..	..
Dufferin	6	..	..	1	..	..	..
Duke	1	..	1	..	1	..	..
Dundas	16	..	..	..	..	..	..
Dunn avenue	5	..	..	..	..	..	..
Dupont	20	..	..	..	..	..	..
Earnbridge	2	..	..	..	..	..	..
East avenue	3	..	..	..	..	..	..
Eastern avenue	6	..	..	..	..	..	..
Edwin avenue	10	..	..	..	..	..	..
Edmond avenue	4	..	..	..	..	..	..
Elizabeth	3	..	..	..	..	..	..
Elliott	3	..	..	..	..	..	..
Elm avenue	..	1	..	..	..	..	..
Elm	5	..	1	..	..	..	..
Elm grove	2	..	..	..	..	..	..
Emerson avenue	4	..	..	..	..	..	..
Englewood avenue	1	..	..	..	..	..	..
Esplanade, east	1	..	..	..	..	..	..
Essex	2	..	..	..	..	..	..
Esther	2	..	..	..	..	..	..
Exhibition avenue	2	..	..	..	..	..	..
Euclid avenue	38	..	..	..	..	..	..
Farley avenue	3	..	..	..	..	..	..
Fennings	2	..	..	..	..	..	..
First avenue	6	..	..	..	..	..	..
Fisher	1	..	..	..	..	..	..
Florence	1	..	..	..	..	..	..
Francis	..	..	..	..	1	..	..
Franklin avenue	7	..	..	..	..	..	..
Frederick	1	..	..	..	..	..	..
Front, east	..	..	..	1	1	1	..
Front, west	..	..	1	1	..	..	..
Fuller	2	..	..	..	..	..	..
Garden avenue	10	..	..	..	..	..	..
Garnett avenue	3	..	..	..	..	..	..
George	1	..	..	..	..	..	..
Gerrard, east	6	1	..	..	..	..	..
Gerrard, west	3	..	..	..	..	..	..
Gilead place	4	..	..	..	..	..	..
Gifford	2	..	..	..	..	..	..
Givens	28	..	..	..	..	..	..
Gladstone avenue	8	1	..	..	..	..	..
Gladstone place	2	..	..	..	..	..	..
Glen road	1	..	..	..	..	..	..
Gordon avenue	..	.	1	..	..	..	..
Grace	8	..	..	..	..	..	..
Grant	2	..	..	..	..	..	..

HOUSE SERVICES LAID DURING 1891—*Continued.*

Street.	½-in.	⅝-in.	¾-in.	1-in.	2-in.	4-in.	6-in.
Grange avenue	5	..	..	..	..	..	..
Grenville	8	..	..	..	..	..	..
Gwynne avenue	2	..	..	..	..	..	..
Hallam	3	..	..	..	..	..	..
Halton	..	..	1	..	..	..	..
Hamburg avenue	7	..	..	..	..	..	..
Harbord	..	1	..	..	..	..	..
Hamilton	4	..	..	..	..	..	..
Harris	2	..	..	..	..	..	..
Harrison	5	..	..	..	..	..	..
Hayden	1	..	..	..	..	..	..
Hayter	4	..	..	..	..	..	..
Hazelton avenue	1	..	..	..	..	..	..
Harvard avenue	2	..	..	..	..	..	..
Hepbourne	4	..	..	..	..	..	..
Heward	8	..	..	..	..	..	..
Highland avenue	7	..	..	..	..	..	..
Hickson	1	..	..	..	..	..	..
Homewood avenue	3	..	..	..	..	..	..
Howard	4	..	..	..	..	..	..
Howie	4	..	..	..	..	..	..
Howland avenue	3	..	..	..	..	..	..
Huron	14	2	..	..	..	..	..
Inkerman	2	..	..	..	..	..	..
Irwin avenue	1	..	..	..	..	..	..
Isabella	..	1	1	..	..	..	..
Jameson avenue	8	..	..	..	..	..	..
Jarvis	3	..	2	..	1	..	..
Johnston avenue	3	..	..	..	..	..	..
Jones avenue	6	..	..	..	..	..	..
Kerr's lane	2	..	..	..	..	..	..
Kensington crescent	4	1	..	..	..	..	..
Kensington avenue	7	..	..	..	..	..	..
Ketchum avenue	3	..	..	..	..	..	..
King, east	2	1	1	..	..	..	..
King, west	3	..	..	..	..	2	..
Lake	3	..	..	..	..	..	..
Lakeview avenue	4	..	..	..	..	..	..
Langley avenue	6	..	..	..	..	..	..
Laing	1	..	..	..	..	..	..
Lansdowne avenue	12	..	..	..	..	..	..
Lappin avenue	10	..	..	..	..	..	..
Lee avenue	2	..	..	..	..	..	..
Leopold	1	..	..	..	..	..	..
Leonard avenue	1	..	..	..	..	..	..
Lindsay avenue	6	..	..	..	..	..	..
Lippincott	19	..	..	..	..	..	..
London	2	..	..	..	..	..	..
Logan avenue	21	..	..	..	..	..	..
Lowther avenue	3	..	..	..	..	..	..

HOUSE SERVICES LAID DURING 1891—*Continued.*

Street.	½-in.	⅝-in.	¾-in.	1-in.	2-in.	4 in.	6-in.
Lorne crescent	2	..	..	..	..	..	..
McCaul	11	..	..	..	..	..	..
McGill	5	..	..	1	..	..	..
McGee	3	..	..	..	..	..	..
McMillan avenue	4	..	..	..	..	..	..
McKenzie Avenue	1	..	..	..	..	..	..
McMurrich	2	..	..	..	..	..	..
McDonnell avenue	13	..	..	..	..	..	..
McPherson avenue	17	..	..	..	..	..	..
Madison avenue	25	..	..	..	..	..	..
Maitland place	3	..	..	..	..	..	..
Major street	5	..	..	..	..	..	..
Manchester avenue	3	..	..	..	..	..	..
Manning avenue	35	..	..	..	1	..	..
Maple	1	..	..	..	..	..	..
Marion	3	..	..	..	..	..	..
Markham	37	..	..	..	..	..	..
Marlboro' avenue	21	..	..	..	..	..	..
Margueretta	8	..	..	..	..	..	..
Maud	1	..	..	..	..	..	..
Maynard avenue	3	..	..	..	..	..	..
Mechanics avenue	2	..	..	..	..	..	.
Melbourne avenue	1	..	..	..	..	..	..
Melady's lane	3	..	..	..	..	..	..
Melville	3	..	..	..	..	..	..
Milan	1	..	..	..	..	..	..
Mill Stone lane	..	..	..	..	1	..	..
Mitchell avenue	2	..	..	..	..	..	..
Millicent	1	..	..	..	..	..	..
Morrison	2	..	..	..	..	..	..
Morse	8	..	..	..	..	..	..
Moutray	2	..	..	..	..	..	..
Munro	4	..	..	..	..	..	..
Murray	1	..	1	..	..	..	..
Mutual	3	.	..	..	..	..	..
Nassau	4	..	..	..	..	..	..
Nelson	1	..	..	..	..	..	..
Niagara	2	..	1	..	..	..	..
Noble	2	..	..	..	..	..	..
Norfolk avenue	2	..	..	..	..	..	..
North drive	..	..	1	..	..	..	..
North	..	..	1	..	..	..	..
Oak	7	..	..	..	..	..	..
O'Hara aveuue	7	..	..	..	..	..	..
Olive avenue	9	..	..	..	..	..	..
Ontario	4	..	..	..	..	..	..
Oxford	2	..	..	..	..	..	..
Ossington avenue	29	..	..	..	..	..	..
Pape avenue	16	..	..	..	..	..	..
Palmerston avenue	14	..	..	..	..	..	..

HOUSE SERVICES LAID DURING 1891—*Continued.*

Street.	½-in.	⅝-in.	¾-in.	1-in.	2-in.	4-in.	6-in.
Parliament	6	1	..	..	..	..	..
Park road	1	..	..	..	..	..	..
Pearce avenue	1	..	..	..	..	..	..
Pears avenue	1	1	2	..	..	..	..
Paul	2	..	..	..	..	..	..
Pearson avenue	13	..	..	..	..	..	..
Perth	9	..	..	..	..	..	..
Portland	1	..	..	..	..	..	..
Poucher	2	..	..	..	..	..	..
Prince Arthur avenue	2	..	..	..	..	..	..
Price	1	..	..	..	..	..	..
Queen, east	20	..	2	1	1	..	..
Queen, west	22	2	1	1	..	..	..
Queen's Park	..	..	..	2	..	..	..
Radenhurst	2	..	..	..	..	..	..
Rebecca	5	..	..	..	..	..	..
Regent	10	..	..	..	..	..	..
Regent lane	9	..	..	..	..	..	..
Reid	1	..	..	..	..	..	..
Reid's lane	1	..	..	..	..	..	..
Richmond, east	..	..	1	..	..	..	..
Richmond, west	2	..	..	1	..	..	..
River	8	..	..	..	..	..	..
Rolyat	1	..	..	..	..	..	..
Robert	3	..	..	..	..	..	..
Robinson	2	..	..	..	..	..	..
Roncesvalles avanue	1	..	..	..	..	..	..
Royee avenue	4	..	..	..	..	..	..
Roxborough avenue	5	..	..	..	..	..	..
Rosedale road	1	..	1	..	..	..	..
Rusholme road	5	..	..	..	..	..	..
Russett	1	..	..	..	..	..	..
Ruth	1	..	..	..	..	..	..
Sackville	24	..	..	..	..	..	..
St. Albans	1	..	..	..	..	..	..
St. Clarens	7	..	..	..	..	..	..
St. David	2	1	..	..	..	..	..
St. George	5	1	2	..	..	..	..
St. Joseph	6	2	..	..	..	..	..
St. James' avenue	1	..	..	..	..	..	..
St. Nicholas	..	1	..	1	..	..	..
St. Patrick	11	..	..	..	..	..	..
St. Paul	3	..	..	..	..	..	..
St. Thomas	1	..	..	..	..	..	..
Salem avenue	5	..	..	..	..	..	..
Salisbury avenue	2	..	..	..	..	..	..
Saulter	1	..	..	..	..	..	..
Saurin	4	..	..	..	..	..	..
Scollard	1	..	..	..	..	..	..
Seaton	5	..	..	..	..	..	..

HOUSE SERVICES LAID DURING 1891—*Continued.*

Street.	½-in.	⅝-in.	¾-in.	1-in.	2-in.	4 in.	6-in.
Shanly	3	..	..	..	..	..	..
Shaw	16	1	..	..	..	..	..
Sherbourne	7	..	..	..	..	..	..
Sorauren avenue	4	..	..	..	..	..	..
Sheridan avenue	6	..	..	..	..	..	..
Shuter	5	..	..	..	..	..	..
Simcoe	..	..	1	..	..	..	..
Simpson	14	..	..	..	..	..	..
Smith	2	..	..	..	..	..	..
Spencer avenue	2	..	..	..	..	..	..
Spadina avenue	27	1	..	..	..	..	..
Springhurst avenue	11	..	..	..	..	..	..
Stephanie place	2	..	..	..	..	..	..
Sully	7	..	..	..	..	..	..
Sully crescent	7	..	..	..	..	.	..
Strachan avenue	4	..	..	..	..	..	..
Sumach	13	..	..	..	..	..	..
Sullivan	1	1	..	..	.	..	..
Sultan	..	1	..	..	..	..	..
Sussex avenue	1	..	..	..	..	..	..
Sylvan avenue	1	..	..	..	..	..	..
Sword	1	..	..	..	..	..	..
Sydenham	21	..	..	..	..	..	..
Symington avenue	12	..	..	..	..	..	..
Tate	1	..	..	..	..	..	..
Taylor	1	.	..	..	..	..	.
Temperance	..	..	1	..	..	..	..
Teraulay	2	..	..	..	..	..	..
Tecumseth	7	..	..	..	..	..	..
Toronto	..	..	..	..	1	..	..
Tranby avenue	6	..	..	..	..	..	..
Trinity	1	..	..	..	..	..	..
Trinity square	2	1	..	..	..	..	..
Tyndall avenue	3	..	..	..	..	..	..
Turner avenue	2	..	..	..	..	..	..
Union	2	..	..	..	..	..	..
Ulster	1	..	.	..	..	..	..
Vermont	2	..	..	..	..	..	..
Victoria place	7	..	..	..	..	..	..
Victoria crescent	1	..	..	..	..	..	..
Victoria	..	..	..	..	..	2	..
Victor avenue	10	..	..	..	..	..	..
Virtue	5	..	..	..	..	..	..
Walker avenue	3	.	..	..	..	..	..
Wallace avenue	6	..	..	..	..	..	..
Walmer road	7	..	..	..	..	..	..
Walton	1	..	..	..	..	..	..
Wardell	2	..	..	..	..	..	..
Water	2	..	..	..	..	..	..
Wellington west	1	..	..	..	..	..	..

HOUSE SERVICES LAID DURING 1891—*Continued.*

Street.	½-in.	⅝-in.	¾-in.	1-in.	2-in.	4-in.	6-in.
Wellington place	2	..	..	..	..	..	..
West Lodge avenue	..	..	..	..	..	..	1
West avenue	4	..	..	..	..	..	..
Westmoreland avenue	14	..	..	..	..	..	..
Wickson avenue	1	..	..	..	..	..	..
Widmer	1	..	..	..	..	..	..
William	1	..	..	..	..	..	..
William avenue	2	..	..	..	..	..	..
Wilson	..	1	..	..	..	..	..
Wilton avenue	3	..	..	..	..	..	..
Winchester	4	..	..	..	..	..	..
Withrow avenue	2	..	..	..	..	..	..
Wood	1	..	..	..	..	..	..
Woodlawn avenue	5	1	..	..	..	..	..
Woolesley	1	..	..	..	..	..	..
Wright avenue	7	..	..	..	..	..	..
Wyatt avenue	3	..	..	..	..	..	..
Yarmouth road	4	..	..	..	..	..	..
Yonge	21	..	1	1	..	4	..
York	3	..	..	..	..	..	..
	1995	33	34	24	11	13	1

SIZE OF SERVICES.

	¼-in.	⅜-in.	½-in.	⅝-in.	¾-in.	1-in.	1½-in.	2-in.	2½-in.	3-in.	4-in.	6-in.	Total
Services laid previous to 1875*	..	..	....	..	..	..	..	..	..	..	..	..	..
New services laid 1875	..	..	617	194	38	7	4	5	..	1	..	..	866
" " 1876	..	..	900	80	11	8	1	4	1	8	..	..	1013
" " 1877	..	..	1,083	43	9	8	..	10	..	14	..	..	1167
" " 1878	86	1427	717	28	5	9	..	5	..	14	1	..	2292
" " 1879	..	1248	633	47	9	5	..	4	..	12	..	..	1958
" " 1880	..	607	385	26	7	3	..	8	..	19	..	..	1055
" " 1881	..	1375	1,275	62	17	17	..	7	..	17	1	..	2771
" " 1882	..	625	1,139	44	23	20	..	5	..	14	..	..	1870
" " 1883	..	373	1,311	70	16	13	..	17	..	17	3	..	1820
" " 1884	..	441	1,519	70	13	25	..	9	..	20	2	..	2099
" " 1885	..	190	2,068	56	26	13	..	7	..	5	..	1	2366
" " 1886	..	14	2,741	92	37	29	..	9	..	25	..	8	2955
" " 1887	..	10	3,062	106	55	38	..	15	..	25	..	4	3315
" " 1888	..	..	2,856	101	32	22	..	19	..	14	7	4	3055
" " 1889	..	..	3,087	127	52	45	..	19	..	1	24	1	3356
" " 1890	..	..	1,995	83	37	35	..	16	..	..	24	1	2191
" " 1891	..	..	1,995	33	34	24	..	11	..	..	13	1	2111
	86	6310	27,383	1262	421	321	5	170	1	206	75	20	36,260

* No record.

STATEMENT OF HOUSE SERVICES IN USE 31ST DECEMBER, 1891.

Total number of Services in use previous to 1874					1,375
" " "	laid during 1874				552
Number of New "	laid during 1875				842
" Renewed "	"				24
" New "	"	(by permit)	1876		141
" Renewed "	"	"	"		12
" New "	laid by Commission,		1876		602
" Renewed "	"	"	1876		258
" New "	"	"	1877		1,006
" Renewed "	"	"	1877		161
" New "	"	Corporation,	1878		2,189
" Renewed "	"	"	1878		103
" New "	"	"	1879		1,861
" Renewed "	"	"	1879		97
" New "	"	"	1880		1,014
" Renewed "	"	"	1880		41
" New "	"	"	1881		2,654
" Renewed "	"	"	1881		117
" New "	"	"	1882		1,826
" Renewed "	"	"	1882		44
" New "	"	"	1883		1,766
" Renewed "	"	"	1883		54
" New "	"	"	1884		2,087
" Renewed "	"	"	1884		12
" New "	"	"	1885		2,344
" Renewed "	"	"	1885		22
" New "	"	"	1886		2,936
" Renewed "	"	"	1886		19
" New "	"	"	1887		3,250
" Renewed "	"	"	1887		65
" New "	"	"	1888		2,990
" Renewed "	"	"	1888		65
" New "	"	"	1889		3,288
" Renewed "	"	"	1889		68
" New "	"	"	1890		2,136
" Renewed "	"	"	1890		55
" New "	"	"	1891		2,058
" Renewed "	"	"	1891		53
New Services in Yorkville at time of annexation					448
" " Parkdale	"	"			885
					39,520
Less number of Renewed Services					1,270
					38,250

SERVICE ORDERS BY MONTHS, 1891.

January	38
February	84
March	52
April	145
May	277
June	363
July	296
August	211
September	189
October	187
November	170
December	99
	2,111

SCHEDULE No. 14.

LIST OF METERS IN USE ON THE 31ST. OF DECEMBER, 1891, GIVING DESCRIPTION AND SIZE.

Style of Meter.	6-in.	4-in.	3-in.	2-in.	1½-in.	1-in.	¾-in.	⅝-in.	½-in.	Totals.
Worthington	..	2	40	77	15	135	68	33	1	371
Kennedy, Glasgow	17	5	13	7	..	1	..	..	..	43
Crown	..	49	45	51	..	82	247	617	33	1,124
Thompson	..	..	..	..	..	..	..	2	..	2
Hersey	..	..	..	..	..	..	..	2	2	4
Totals	17	56	98	135	15	218	315	654	36	1,544

Total number of meters in use in 1891, 1,544.

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1891

Toronto. Dept. of Public Works
Report of the city engineer

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